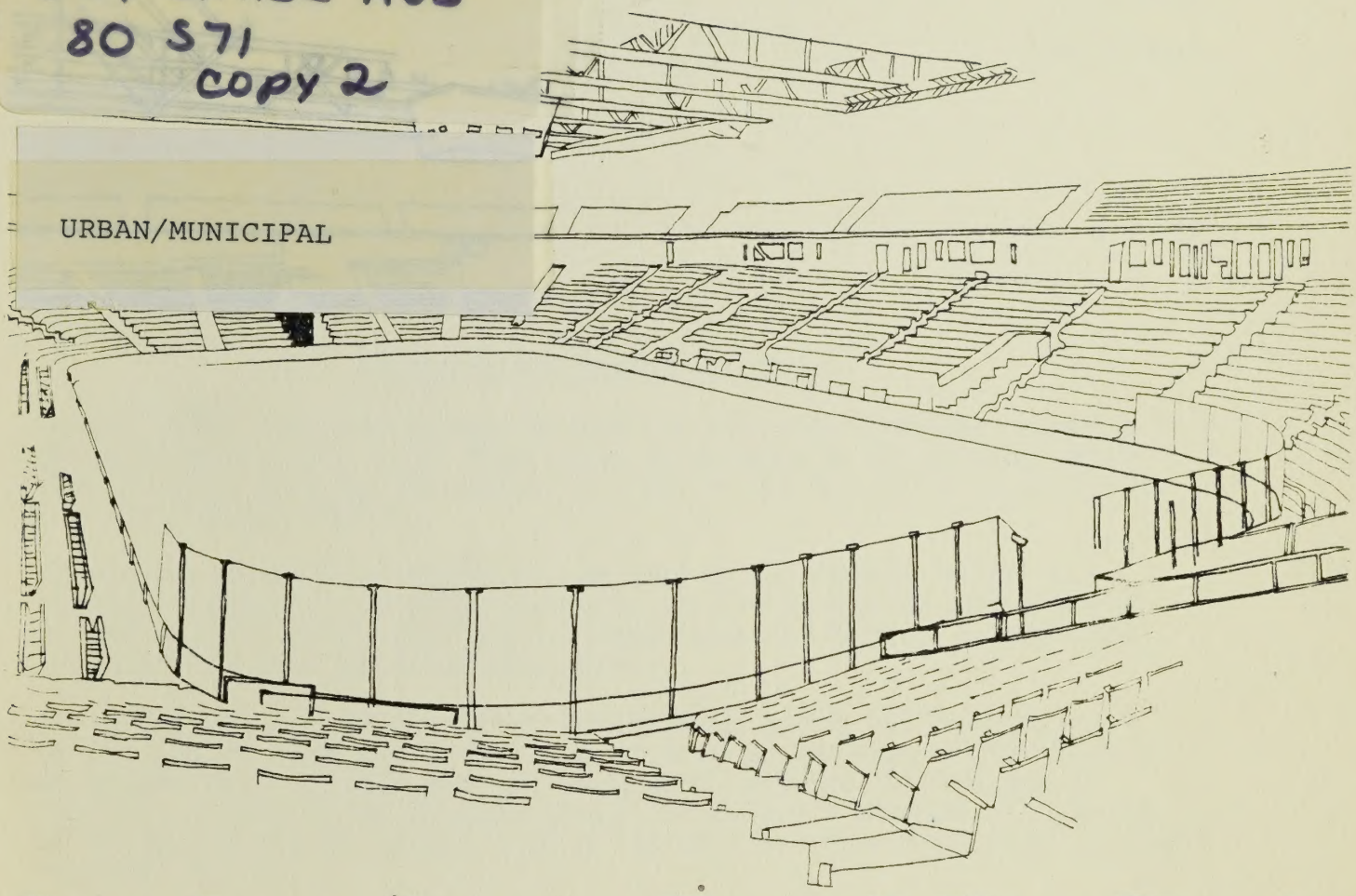
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URBAN/MUNICIPAL



Stadium/Arena Feasibility Study

A Proposal

IBI Group

in association with

Group Eight Engineering Ltd.

Hanscomb Roy Associates

June 1980

IBI Group
156 Front Street West
6th Floor
Toronto, Canada
M5J 2L6
(416) 596-1930

June 20, 1980

Mr. J. MacDonald
Mayor
City of Hamilton
City Hall
Hamilton, Ontario

Dear Mayor MacDonald:

Stadium/Arena Feasibility Study

Further to our interview on June 20 with the selection Committee regarding the above study, this letter constitutes an addendum to our proposal dated June 17, 1980, covering the conduct of a public opinion survey in connection with the proposed facility.

The opinion survey will constitute a minimum of 400 useable replies to a telephone survey of a carefully-selected, stratified sample, representative of people living in the Hamilton-Burlington area, in terms of factors such as location, income and demographic factors.

The survey will seek to determine representative public attitudes to a potential new stadium/arena in Hamilton, in terms of the types of functions to be accommodated, the location, the respondent's attitude towards such a facility, and his or her attitude toward the community benefits which might be forthcoming and the extent to which the municipal government might provide financial support.

We are prepared to undertake such a survey as part of the project, to be completed if possible during Phase I, employing a reputable survey firm on a subcontract basis to design the sample, administer the questionnaires and carry out computer cross tabulations of the results. IBI Group, as prime consultants, will play a major role in the questionnaire design, assessment of questionnaire pre-testing, interpretation of results and reporting of results.

We are prepared to carry out the survey as described for a fixed price of $20,000. As noted during our presentation, we are prepared to carry out the basic study as described in our proposal of June 17 for a fixed price of $74,500. If it is decided to include the survey, the fixed price for the entire project would, therefore, be $94,500. The fixed price in each case includes all staff fees and out of pocket expenses.

It would be our intention to bill the City for one-half of the fixed price amount at the end of July, 40% at the end of August, and the remaining 10% on submission of the final report early in September.

IBI is a group of companies practicing professional consulting and is affiliated with Beinnaker/Irwin Associates Architects, Engineers

Mr. J. MacDonald

June 20, 1980

We appreciate your invitation to submit this addendum to our original proposal, and would be prepared to commence work on authorization during the week of June 23.

Yours sincerely
IBI GROUP

Neal A. Irwin
Managing Director

IBI Group
156 Front Street West
6th Floor
Toronto, Canada
M5J 2L6
(416) 596-1930

June 17, 1980

Mr. J. R. Jones
Secretary, Board of Control
City Hall
Hamilton, Ontario

Dear Mr. Jones:

Feasibility Analysis for
Stadium/Arena, Hamilton, Ontario

We are pleased to submit the proposal for the preparation of a feasibility study aimed at determining the potential for adding to the Hamilton Community's service structure a new Arena/Stadium facility. The attached proposal includes a detailed outline of our suggested work program, an estimate of the budget requirements, a description of our experience in related areas, as well as brief descriptions of the experience of the members of the study team who are not members of the IBI Group.

We have assembled a multi-disciplinary team representing the required disciplines to undertake this most challenging study. Our proposed team includes:

IBI Group: planners, management consultants, archictects, municipal engineers,urban designers and transportation analysts.

Hanscomb Roy Associates: serving as subconsultants and providing cost consulting expertise.

Group Eight Engineering Limited: structural, mechanical and electrical engineers.

Economic Research Associates: providing advice on the feasibility, market and operation of major sports and recreation facilities.

Subsequent to your review of our proposal, we would be glad to discuss our proposed work program in greater detail, and look forward to hearing from you in the very near future.

Yours very truly
IBI GROUP

Neal A. Irwin
Managing Director

NAI:jc
Enc.

IBI is a group of companies practicing professional consulting and is affiliated with Beinhaker/Irwin Associates Architects, Engineers

FEASIBILITY ANALYSIS FOR STADIUM-ARENA HAMILTON, ONTARIO

BACKGROUND

In response to the continuing demand by members of the Hamilton Business community, citizens, and local social interest groups for a new Stadium/Arena facility, the City of Hamilton has requested that qualified consultants submit proposals to carry out a financial and market feasibility analysis for the establishment of such a complex within the City's borders. The recent concern for the expansion of Ivorwynne Stadium's side line seating capacity presents various development alternatives for the analysis, namely, the refurbishing and expansion of the existing stadium with the construction of an additional arena facility versus the development of an entirely new Stadium/Arena complex.

It is understood that the facility, once expanded or replaced, must be sized to accommodate major spectator events and should consider provisions for future potential in accommodating such features as a National Hockey League or North American Soccer League franchise, or international events such as the Pan-Am Games. Additionally, it is recognized that Hamilton, in the past, has supported sports activities such as a Junior A hockey team and continues as the home of the CFL Tiger Cats. However, if the City is to maintain or improve its competitive position in relation to other major Canadian municipalities and the facilities they offer, the existing sports facilities must be updated and improved.

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STUDY OBJECTIVES

The primary study objective is to undertake a comprehensive financial and market feasibility study to determine the location and viability of a Stadium/Arena complex for the City of Hamilton, Ontario. In order to provide a comprehensive analysis for this objective, various development alternatives will be investigated:

- the refurbishing of the existing stadium with an arena complex either adjacent to the stadium or located elsewhere in the City;
- the development of an entirely new Stadium/Arena complex.

A further objective following the preliminary site selection will be to refine the market and financial analyses, and develop detailed suggestions for the design and operations of the facility. Pertinent facts, statistics and data relating to existing facilities in Canada and the U.S. will also be provided. The final report will be an objective technical anlaysis that will serve the decision-making provess and help to gain momentum for implementing the project.

PROPOSED APPROACH

Our proposed approach, comprising two phases, includes the following steps:

Phase 1: Market Demand and Site Assessment

1.1 Demand analyses for new arena and stadium facilities.

1.2 State of the art survey of stadia and arenas.

1.3 Accessibility analyses.

1.4 Private/Public agencies and Governmental consultation.

1.5 Cost/benefit analysis of candidate sites.

1.6 Shortlist of selected sites.

Phase 2: Analysis of Preferred Sites

2.1 Analysis of development potential of preferred sites.

2.2 Market analyses.

2.3 Design recommendations.

2.4 Cost analyses.

2.5 Socio-economic cost/benefit analyses.

2.6 Impact analyses.

2.7 Methods of operations.

2.8 Public and Governmental consultation.

2.9 Summary of conclusions and recommendations.

The proposed program outlined is elaborated in more detail in the following section.

WORK PROGRAM

Phase 1: Market Demand and Site Assessment

This phase of the work program, which can be viewed as a first-round analysis of the demand for a Stadium/Arena complex, will define the general market, private interests and public requirement for the proposed arena facility. In addition, all the considerations related to the state of the present stadium and expansion requirements will be examined. The resulting analysis of the first phase will serve as the basis for subjecting alternatives to a cost/benefit comparison and thus determining a shortlist of preferred sites. Accordingly, the following tasks will be undertaken:

1.1 Demand Analysis for New Arena and Stadium Facilities

- Determine the requirements for the new facility through interviews with concerned Government agencies, private organizations, other public agencies, sport organizations, sport critics, local professional and amateur associations, national and regional mass entertainment, industry representatives, national and local media representatives.
- Information regarding the volumes of people and range of activities which can be expected will be compiled and listed in standardized format which would be used to forecast the types and size of required facilities, parking and locational criteria to serve the range of anticipated activities.
- This information will also serve as the data base for forecasting revenues from the various sources such as seats, box office, Stadium/Arena rentals, concessions, etc.

1.2 State of the Art Survey

- Survey the most recently built arenas and stadia in Canada and the United States, which most closely resemble the requirements for the proposed Hamilton facility as established in the previous tasks. A minimum of three complexes and up to six complexes will be examined. This examination will not only compare the overall scale and facility components but will also gather all required financial information for the purpose of cost revenue comparisons, operations, and conceptual design.

1.3 Accessibility Analysis

- The City's previous feasibility study, prepared in 1976, placed significant emphasis on accessibility patterns as a primary criterion for site selection. Through our extensive transportation planning work in the Hamilton-Wentworth Region, we appreciate that this previous study must now be reviewed and updated in light of more recent plans tc extend the Region's roadway network and develop a rapid transit system within the City. These transportation elements will significantly affect the shortlist of candidate sites to be analyzed in Phase 2 and ultimately the preferred site.

1.4 Consultation with Government and Private/Public Agencies

- Concerned public and private agencies (these concerns will have been identified in Step 1.1) will be canvassed and presented with the summary of the analysis undertaken up to this point, and their views and comments elicited. Furthermore, government agenices from which shared funding may be available, will be identified and discussions will be undertaken in order to establish the potential for such funding.

- It is further proposed that, in view of the protracted period in which this study must be undertaken, general public reaction and input be limited to written responses. This may be effectively undertaken through mass media communications indicating the availability of Phase I results at theCity Clerk's office and requesting written input reponse within a specific time frame.

- Tabulate all commentary and reponses for the purpose of input to the site selection process.

1.5 Cost/Benefit Analyses of Sites

- Each site identified in the previous steps will be further tested against the following criteria:

  - Site zoning
  - Development suitability
  - Ease of acquisition
  - Cost of acquisition and development
  - Direct and indirect land use impact

- Accessibility
- Suitability of development vis a vis local and regional official plans
- Public acceptability.

The sites analyses will be tabulated and ranked against the above criteria for the purpose of establishing the most suitable sites.

1.6 Interim Report: Shortlist of Selected Sites

- In this task, the results of all of the previous steps will be combined and summarized in a draft report for discussion and presentation with the Management Committee. This Phase 1 report will include recommendations for further analyses to be undertaken in the second phase of the study. These recommendations will include the identification of a shortlist of probable sites which will be further refined subsequent to the presentation and subject to review by the Management Committee.

Phase 2: Analysis of Preferred Sites

On the basis of the Phase I work, in this phase pertinent analytical, financial, cultural and operational considerations will be refined in order to define and identify the preferred site(s), which will adequately meet the present and future needs of the Greater Hamilton community.

The following steps, required to carry out this phase are identified in detail below:

2.1 Refined Analysis of Development Potential of Preferred Sites

- Re-examine shortlist of proposed sites and refine planning factors, including timing adjustments if re-zoning and Official Plan amendments are required. In addition, sub-soil investigations will be undertaken as appropriate to determine the site capability for development.

2.2 Market Analyses

- All potential users and participants identified in Phase I will be interviewed to determine the specific demand for the facility and potential revenues derived through use. This data will serve as input to the market viability of the proposed facility and will include a detailed list of all periods by type of use for which the facilities may be used.

2.3 Design Recommendations

- In this step, conceptual designs will be refined to reflect the specific site constraints as well as to reflect a sensitivity to the potential impact on nearby and adjacent land uses. A functional plan for each candidate site will be prepared, indicating circulation patterns, parking, the siting and massing of structures and landscaping. Where special design problems are identified for any candidate site, these problems will be analyzed in more detail to confirm the limitations which may be implied. The product will be a series of illustrative site plans and conceptual sketches, indicating the general character and massing of the buildings and the environs related to the particular characteristics of each of the candidate sites.

2.4 Cost Analysis

- On the basis of the conceptual designs, a refined cost analysis will be undertaken. In this phase, these costs will be refined to include the following:

  - land acquisition costs
  - site development costs
  - servicing and parking costs
  - construction costs of building
  - special equipment costs
  - soft cost items such as: professional fees, development fees
  - general infrastructure costs such as: connecting roads and services
  - operating costs such as: administrative, advertising and promotion; energy costs; cleaning and janitorial costs; building maintenance; equipment maintenance and renewal; insurance; taxes; levies; and others as identified.

2.5 Socio-Economic Cost/Benefit Analyses

- In addition to the socio-economic cost/benefit analysis undertaken in Phase I, in this phase these impacts on the community's professional and amateur sport associations will be identified. Furthermore, the costs and benefits flowing to the existing and potential service structure will be detailed. In addition, the impact associated with the possible redevelopment of existing residential areas and/or business areas will be quantified to provide an indication of the indirect cost of redevelopment.

2.6 Impact Analyses

- In this section, considerations such as the impact on the existing transportation structure, off site parking requirements, nearby and adjacent land uses, will be identified and quantified. Furthermore, the impact of the proposed facility on the present recreational opportunities within the general municipality's will be identified. Other impacts will be identified during the course of the study and will be taken into account as the study progresses.

2.7 Methods of Operation

- On the basis of surveys undertaken of similar facilities in Canada and the U.S., recommendations for operation of the proposed facility will be considered. The recommendations will include general conditions and agreements with potential users; rental rates; contractual considerations; number of employees (permanent and temporary); concession operations; revenue from parking facilities; taxes; licensing fees; and others as identified.

2.8 Public and Governmental Consultation

- On the basis of the suggested format for input through public and private concerns, in Phase 1, a specific format for input will be developed and presented for review by the management committee. The purpose of this review of the proposed participation format will be to identify and formulate the most efficient method of communication given the short study period requirement.

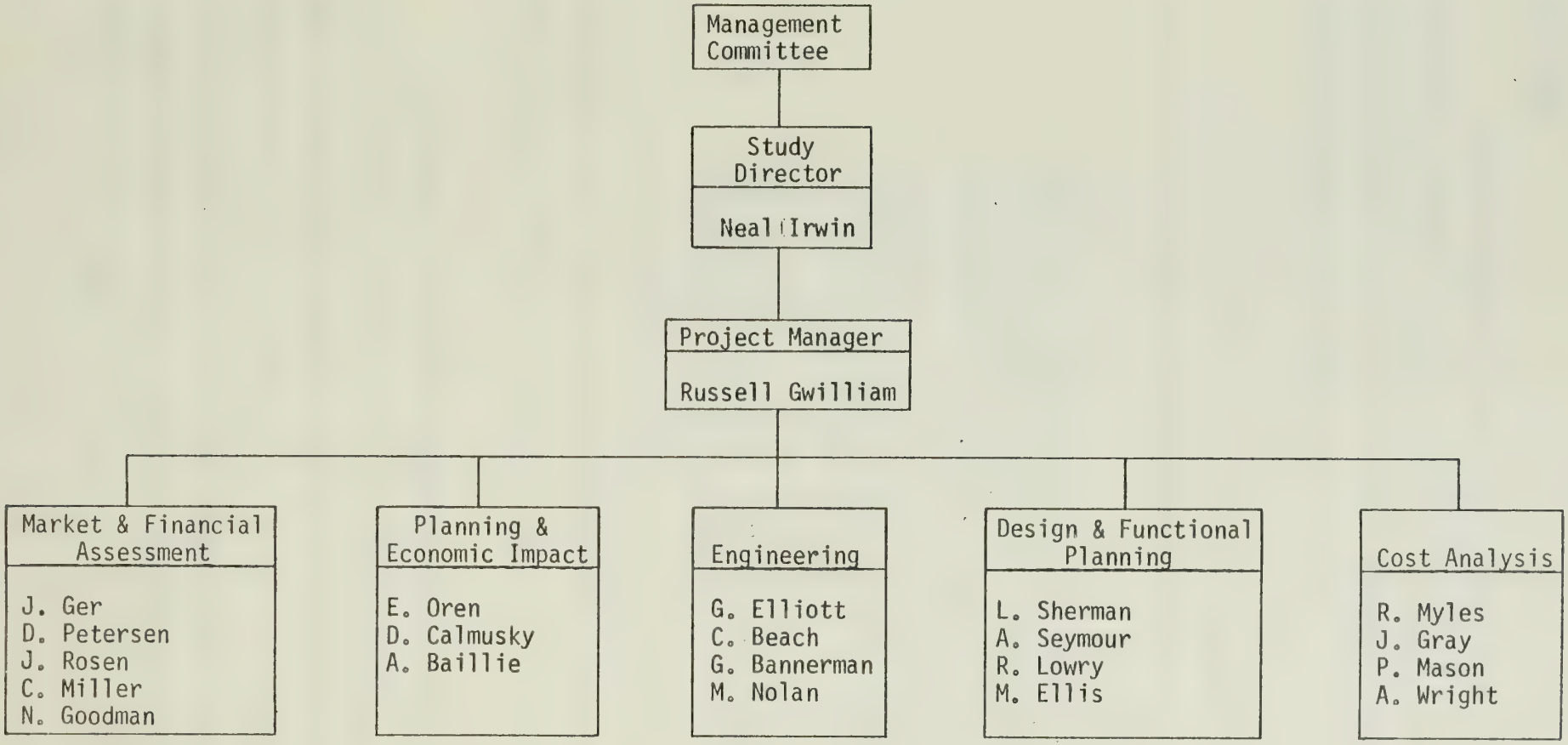
2.9 Summary of Conclusions and Recommendations

- The conclusions and recommendations arrived at throughout the study process will be presented in a report format which will consist largely of tabulations with appropriate supporting text especially as it relates

to professional opinion. Tables will summarize the data derived through survey and through calculations. In addition, in order to provide meaningful data for the financial analysis, all estimates will be prepared in a format suitable for direct comparisons between each alternative and will permit analysis against possible funding sources. Furthermore, adjustments will be made to all cost and revenue data base to account for differences in size, shape, location and other requirements of each development alternative. The estimates will be presented on an annual basis, escalated to the time frame which is consistent with each construction schedule. Net revenue estimates will be calculated on the basis of a present value calculation adjusted to the base year as determined in the preliminary phases of this study.

STADIUM/ARENA FEASIBILITY STUDY

EXHIBIT 1: STUDY TEAM ORGANIZATION



STUDY TEAM

The study team will be led by the IBI Group, a national multi-disciplinary firm with its headquarters in Toronto. IBI Group will provide project management capabilities as well as expertise in market research, planning and economic/financial analysis.

For the purpose of this study, IBI Group will be assisted by the following firms which will serve as sub-consultants:

- Group Eight Engineering Limited, of Hamilton, providing mechanical, electrical and structural engineering services as well as specific expertise in arena and stadium design and intimate familiarity with Ivor Wynne Stadium and the various arenas in and around Hamilton.

- Hanscomb Roy Associates, Toronto, cost consultants and quantity surveyors, providing consulting imput regarding capital and operating costs for the arena/stadium facilities as they relate to specific sites.

- Economic Research Associates, Boston Mass., providing the team with advice in economic, finance, marketing, planning and Management for a large variety of major recreation and sport facilities.

For the purpose of sub-surface analysis, Group Eight Engineering customairly retains the services of William Trow, a soil consultant who had worked for many clients in the Hamilton area.

As shown in Exhibit 1 opposite, we propose a basic organizational structure for the study team which we have found successful on a large number of consulting studies of this type. Responsibility for the study will be carried in an overall sense by Mr. N.A. Irwin, Managing Director, IBI Group with day-to-day project management by Mr. Russell Gwilliam, Director responsible for our urban and recreation planning, market assessment and financial feasibility studies.

Mr. Irwin has directed a large number of market and economic feasibility studies including a major study for Toronto Union Station as part of the proposed Metro Centre. He also directed the Hamilton Transportation Strategy Study which postulated various alternatives and land use/urban development concepts for Hamilton and surrounding areas. Also in Hamilton, Mr. Irwin directed an engineering, social, environmental, transportation and economic feasibility project to select the first rapid transit corridor for Hamilton.

During his consulting career, Mr. Irwin has carried out a variety of economic and market anlaysis for private and public sector clients. He has designed and carried out public participation programs as part of the planning process. For the Atlantic Development Board, Mr. Irwin conducted a major economic study of the tourist industry in the Atlantic Provinces. He also carried out a series of tourism and recreation studies for the Ontario Ministry of Tourism, including the development and initial application of a comprehensive model of tourism/recreational demand and supply in Ontario and a planning study for improved recreational facilities in the Patricia/Rainy River area of Northwestern Ontaio.

Mr. Russell Gwilliam, Director of the IBI Group, responsible for the firm's practice in planning and market analysis. Mr. Gwilliam will be responsible for the market analysis, financial viability and economic impact of the project. He is a member of the Canadian Institute of Planners, has considerable experience in managing inter-disciplinary studies, and in undertaking market and economic analysis and feasibility studies. He has undertaken a large number of market analysis and feasibility

studies for commercial, industrial residential and other development, including a recent feasibility study for the City of Cambridge to evaluate a major development of hotel/convention/exhibition facilities, auditorium and recreation facilities, office towers and prestige industrial park development.

Other major relevant projects include the evaluation of a site in Scarborough Town Centre of behalf of the Federal Department of Public Works in which financial pro forma were developed relating to a number of alternatives incorporating commercial, recreational and possible residential development; a study to identify the location and new components for the Pickering Town Centre, including regional shopping centre, office campus, civic complex, community facilities and family housing; site analysis of a number of competing sites for the future City Centre of Mississauga. Major recent inter-disciplinary studies include the development of a five-year program for small craft harbours in the Maritimes, on behalf of the Federal Department of Fisheries and Oceans. Mr. Gwilliam also directed the preparation of the comprehensive industrial strategy for the City of Regina, and is currently directing a municipal impost fee study for the City of Port Colborne.

Larry Sherman, Director of the IBI Group, in charge of the firm's architecture, design and engineering practice, will be responsible for those components of the study which relate to architecture and design, engineering, capital costs and site analysis. Mr. Sherman has had extensive experience in directing a wide range of planning studies which include evaluation and planning of urban recreational facilities, and

functional programs and urban design of complex facilities. He was responsible for the Lake Louise Village Planning Study, on behalf of Parks Canada; the planning of a multi-propose community centre in south Ottawa; and planning of various auditoriums and assembly halls for the University of Toronto, Dawson College in Montreal and other institutions.

The responsibilities and general experience of other members of the proposed study team are described below:

Joseph Ger, Senior Consultant with the IBI Group, will serve as Project Manager responsible for the day-to-day management of the study. Mr. Ger specializes in market research and analysis, financial assessment, locational analysis and real estate economics. He will also co-ordinate the market assessment and financial feasibility components. He has recently completed several economic and market studies as well as financial feasibility studies for various facilities such as hotel/convention/exhibition facilities, resorts, commercial and shopping centre developments, housing development and recreation facilities. Mr. Ger is presently assisting the City of Cambridge in a major development of hotel, commercial, industrial and recreational facilities.

Eitan Oren, Senior Consultant with the IBI Group specializing in market research, urban and regional planning, and economic impact assessment. His recent experience includes a market analysis of hotel establishments as part of a feasibility study for hotel/convention/exhibition complex in the City of Cambridge; an economic analysis of recreation harbour facilities in the Maritimes, as part of the five year development program for recreation harbours in the Atlantic Provinces; and other economic analyses and impact studies for various facilities. Mr. Oren will co-ordinate the economic impact

assessment and will assist in the urban and regional planning tasks and market assessment.

Garry E. Elliott, a professional engineer and a senior partner in Group Eight Engineering. He has designed mechanical systems for a large number of arenas including a 3,000 seat arena in Aurora Ontario. Mr. Elliott will be responsible for the engineering portion of the study.

Mr. G. Bannerman, Professional Engineer with responsibility for the design of major steel structures, foundations, and civil works. Mr. Bannerman was responsible for the design of the Central Shipping Building at Dofasco, which is one of the largest high bay buildings in Ontario. He was also responsible for the structural design for the Cambridge and other arenas. Mr. Bannerman will be responsible for the structural and civil support systems for the study.

Mr. M. C. Nolan, Professional Engineer with experience in all aspects of electrical engineering work including concept proposals, comparative cost and feasibility studies, design and field inspections. Mr. Nolan be responsible for the electrical system portion of the study.

Mr. Alan Seymour, Architect and an Associate of Beinhaker/Irwin Associates (and affiliate of the IBI Group). He has had considerable experience in site planning, site analysis and design for a variety of facilities including hotels, commercial complexes, recreational facilities, and residential developments. Mr. Seymour will be involved in the preliminary design of the proposed facility and in the preparation of the conceptual plans and schematics.

Mr. Robert Lowry, B. Arch, MRAIC. Mr. Lowry, an affiliate of the IBI Group, is a registered architect with several years of specialist experience in the area of functional programming: the definition of building requirements prior to the start of design. His experience includes projects with both the private and public sectors in Canada as well as projects in Europe, Africa and the Middle East. His role will be the determination of the spatial requirements of all activities based on the projected demand. Also he will identify the functional relationships among the various activities and spaces to be accommodated to ensure efficient ongoing operation.

Mr. Michael Ellis, B.A., RAIC. (Associate). Mr. Ellis, an affiliate of the IBI Group, specializes in the identification and documentation of program requirements as a basis for identifying activity and space requirements for buildings. His experience has included work with complex client-user groups to establish objectives, define programs, identify activities and document spatial requirements for new construction and rehabilatation. He was active in athletics throughout his academic years and continues to serve as a senior volunteer in Y.M.C.A. programs. Mr. Ellis will identify the full range of programs and activities to be accommodated as a basis for documenting their spatial requirements.

Mr. Alistair Baillie, an Associate of the IBI Group and a civil engineer specializing in urban/regional transportation and parking planning. He has carried out a large number of transportation and parking projects including a travel demand feasibility analysis for specific transportation corridors in the Regional Municipality of Hamilton-Wentworth; analysis of the travel demand for the rapid transit development program for the City of Hamilton; a major study for the City of Toronto to determine the parking

and loading requirements related to various land uses in the central area of the city and other transportation and parking studies for various municipalities in Ontario and elsewhere in Canada. Mr. Baillie will carry out the transportation and parking requirement analysis and will assess the transportation/parking implications for each of the proposed sites including the transportation impact of specific developments.

Mr. Joel Rosen, Principal of J. S. Rosen Management Consultants and an affiliate of the IBI Group. Mr. Rosen specializes in financial and operation analysis and economic feasibility for various tourist and recreation facilities and attractions. He has had a wide range of experience in carrying out marketing and financial feasibility studies on behalf of various tourist attractions, hotels, restaurants and other tourism and recreation facilities. He was a member of the study team that examined the feasibility of expanding Taylor Field football stadium in Regina, Saskatchewan. The study included market analysis with respect to attendance patterns and ticket revenues. He also carried out market and feasibility studies for a convention hotel in Toronto and for the Ontario Congress and Trade Centre. Mr. Rosen will assist the study team in market assessment and financial analysis.

Mr. Craig Miller, a Senior Professional with the IBI Group, will have responsibilities in the market and financial assessments. Mr. Miller's experience in this field includes the financial assessment of a major office and industrial mall complex, an analysis of the financial impact of a major resort hotel, and an assessment of the housing market in London, Ontario. Mr. Miller was also responsible for the economic analysis of a 20 year capital and maintenance expenditive program for commercial fishing harbours in the Maritimes.

Mr. Dan Colmusky, Mr. Colmusky, Planner with the IBI Group will be involved in the Planning and Economic Impact assessment of the study. He is presently involved with development projects in Oakville, Mississauga and Stoney Creek. Mr. Colmusky has direct experience with the details of municipal planning and infrastructure through his past work as a municipal planner and will be responsible for co-ordination with municipal departments and other agencies regarding servicing requirements.

Mr. Calvin Beach, Senior Design Engineer with the IBI Group is specializing in Municipal and Civil Engineering. He has had wide range experience in design and site supervision for a large variety of projects both in Canada and the U.K. Mr. Beach will be involved in the various engineering tasks in regards to the proposed facilities.

Mr. Robert Myles, Partner, Hanscomb Roy Associates, assisting in the management of the Toronto office and sharing responsibility for the production and quality control of the professional services. Among the large number of quantity surveying projects carried out by Mr. Myles and Coburg Arena ($2.5 M) and the Recreation and Cultural Centre in Omaha, Nebraska ($79 M). Mr. Myles will co-ordinate the cost analysis tasks of the study.

John Gray, Senior Quantity Surveyor/Cost Consultant with the Architectural Structural Devision of Hanscomb Roy Associates. He has carried out an Ice Arena Study and participated in a variety of major quantity surveying projects. Mr. Gray will provide the team with architectural and structural cost estimates.

Peter Mason, An Associate of Hanscomb Roy Associates and Senior Cost Consultant - Mechanical Division: His project experience includes the University of Toronto Athletic Complex, Toronto International Airport and theatres in Stratford, Kitchener and York University. Mr. Mason will assist the study team with mechanical cost estimates.

Alan Wright, Senior Consultant in the Electrical Division of Hanscomb Roy Associates. Among the projects he participated in are the University of Toronto Athletic Complex, Trent University Athletic Complex and the Commonwealth Games Stadium in Edmonton.

David Petersen, Vice President of Economic Research Associates in charge of the Florida office. He has played a senior role in a large number of feasibility, operation, and market studies for stadiums, arenas and convention centres. Among these facilities are the New Orleans Superdome, Boston Gardens, Nassau County Colaseum, Los Angeles Forum, and other major sport facilities. Mr. Petersen will advise the team on matters relating to financial feasibility, operation, marketing and economic impact of major sport facilities.

Nomi Goodman, Researcher/Planner with the IBI Group specializing in statistical analysis and market research. Miss Goodman was involved in Market and financial analysis for a variety of facilities and developments including shopping centre developments, commercial developments, housing projects, civic centres, etc. She will provide assistance in market research as well as in data collection and analysis.

Biographical information of each of the above persons is included in appendix "A".

As shown in Exhibit 1, the study team will report directly to the Management Committee which we understand will be set up by the City to oversee the study. We anticipate that the study co-directors will be in regular communication woth the Chairman of the Study Committee, as required.

RELEVANT EXPERIENCE

A summary of the qualifications and relevant experience of the firms and individuals making up the proposed team is presented below:

IBI Group

IBI Group is a national multi-disciplinary consulting firm and is affiliated with the design firm, Beinhaker/Irwin Associates, Architects, Engineers. The combined firms represent a unique combination of analytical disciplines and design skills offering a broad range of services from conceptual planning to project management. Some 120 professionals presently employed by the IBI Group in a number of regional offices: Toronto (head office), Barrie, Calgary, Edmonton, Halifax, Montreal, Regina, Vancouver, Winnipeg, Seattle and Newport Beach, California. The firm has carried out a wide variety of studies and design projects for a variety of facilities including tourism and recreation facilities and commercial developments. The scope of practice of the IBI Group includes urban/regional planning, land development, facilities design, economic/management studies, energy programs and transportation analysis. Some of the relevant projects carried out by IBI Group staff are described below:

Edmonton Exhibition Complex

For the Edmonton Exhibition Association, IBI Group prepared a feasibility study involving a review of existing events, facilities and practices of the exhibition. In addition, the programs of other exhibitions in North America were analyzed and an evaluation of facility alternatives and related access and logistics problems was prepared.

City of Cambridge: Feasibility Study of Hotel/Convention/Exhibition/Sport Complex

A feasibility study and assessment of the economic viability of a multi-use facility including hotel, convention centre,

exhibition space and sport/recreation facility in the City of Cambridge. The analysis was part of a development program for 25 acres of industrial and commercial land. A detailed market analysis was carried out in order to assess the convention, trade show and recreationa potential, and a survey of local businesses was designed and carried out to establish the use of hotel, meeting and exhibition facilities.

Ice Arena/Curling Rinks, Whitby, Ontario

Administration of contract and construction supervision of Whitby arena for a Junior "A" hockey franchise.

Highbanks Park Marina Feasibility Study

A study, conducted for the Federal Department of Indian Affairs and Northern Development, to look into the feasibility of a marina on the Walpole Island Indian Reserve. Following a market analysis, members of the firm determined the requirements of the potential client, and also the minimum facilities and recreational attractions needed at the proposed marina site. Having defined the marina (excavating walls, docks, piles, buildings, landscaping, as well as water, sewage, and electrical system), thay also estimated annual operating costs, and revenues based on the key assumption of the occupancy rate of boat-wells. Possible sources of funds were investigated and non-economic considerations essential to the operation of a successful marina were considered.

Lake Louise Village Planning Study

A study for Parks Canada to prepare a master plan for Lake Louise Visitors' Centre including tourist services, summer and winter accommodation, ski facilities, camping and hiking facilities, etc. The study scope related Lake Louise to other facilities in Banff National Park and development outside the park in Alberta, British Columbia and North West U. S. A.

Northwestern Ontario Tourism Study

Member of the firm conducted a tourism industry study for the Ontario Department of Tourism, designed to evaluate in broad terms the potential of the Northerwestern Ontario Region to support growth in the tourism and recreation sector and to identify, intensive programs and a limited number of potential projects, means whereby the Government of Ontario could encourage and stimulate growth.

Mississauga Valley Community/Recreation Centre

A project to plan a multi-use community and recreational complex which includes an arena and a swimming pool, integrated with two elementary and one secondary public school. The plan includes a large outdoor development comprising playing fields, small-scale play areas, and a small lake.

Sheridan College Recreation Complex, Oakville, Ontario

A large multi-functional recreational complex designed to connect an existing college building to playing fields via a "pedestrian street" which, in turn, provides access to enclosed facilities, including two gymnasia, an arena, indoor rifle range, exercise rooms and other facilities.

Market Studies for a Destination Resort in Muskoka

On behalf of a major private sector corporate client, the IBI Group has reviewed the operation and the facilities of the year round destination resort in the Muskokas. The study included assessment of the property and its market potential, and projections of the tourism market and the market potential of the meetings and convention trade.

University of Manitoba Athletic Facilities

A project to renovate and enlarge the athletic facilities in below grade areas by in-filling open spaces and spanning existing buildings.

Pickering Town Centre

A study to determine the location and components of the Town Centre for Pickering. This included a regional shopping centre, office campus, civic complex, community and recreational facilities and family housing. A major aspect of this work was the evaluation of two sites competing for designation as the centre location. Additionally, development guidelines were produced for the selected sites.

Mississauga Centre Study

Evaluation of alternative concepts for the role and physical form of major and minor centres that will serve the City of Mississauga including the location of major civic facilities as well as commercial facilities.

Union Station Study

As part of the Metro Centre development, on behalf of the City of Toronto, members of the IBI Group carried out an analysis of the feasibility of retaining the Union Station. Important elements in the study were the urban development and transportation implications of retaining the existing station and its impact on real estate rents and land values for proposed development on adjacent lands.

Taylor Field, Regina, Saskatchewan

Member of the study team, who is an affiliate of the IBI Group, participated in a study to examine the feasibility of expanding Taylor Field football stadium in Regina. The study included market analysis with respect to attendance patterns and revenue generated by ticket sales.

Economic Impact, Market and Feasibility Study - The Ontario Congress and Trade Centre

A member of our team, who is an affiliate of the IBI Group, served as the Project Manager for the Canadian component of this study which evaluated the market demand, financial feasibility and economic impact of the proposed convention and trade show facility for Metropolitan Toronto. The study examined the number and type of events that could be booked into the proposed centre, the total market penetration, the competitive position of existing and proposed centres in Metropolitan Toronto, Canada and the United States, projected operating revenues and expenses and economic benefits in terms of income and employment, creation of new businesses and increased tax revenues.

Market and Feasibility Study for a Convention Hotel

A member of the study team, who is an affiliate of the IBI Group, participated in a study for a private developer to evaluate site location, market potential and financial feasibility for a proposed convention hotel of 1,000 rooms and a 25,000 square feet exhibition hall. The study considered two alternative sites in Metropolitan Toronto.

GROUP EIGHT ENGINEERING LIMITED

Consulting Professional Engineers for Mechanical, Electrical, Structural and Civil Engineering.

Group Eight Engineering was formed in 1974, by merging the firms of Atkinson, Parazader, Lostracco and Bannerman, Consulting Civil and Structural Engineers, (established 1960) and Walter Eull and Elliott, Consulting Mechanical and Electrical Engineers, (established 1964). The firm has a staff of 15 Professional Engineers, 20 technologists and technicians and support staff of drafting and field inspectors for a total of 50 people.

Recent Projects

Provincial Office Tower and Convention Centre - Hamilton, Ontario.

Hamilton Art Gallery

Addition to Mohawk College

Dofasco Recreation Complex

Dofasco Central Shipping Building

Arena Projects

Hester Street Arena	-	Hamilton - 2500 seating
Rosedale Arena	-	Hamilton
Aurora Arena	-	Aurora - 3000 seating
Lions Club Rink	-	Stratford
Dufferin Park Arena	-	Stratford
Mitchell Arena	-	Mitchell
Central Arena	-	Burlington
North Park Arena	-	Brantford (2)
Dofasco Recreation Centre	-	Hamilton
Kiwanis Park Arena	-	Burlington
Cambridge Arena	-	Cambridge

Coliseum Experience

Group Eight Engineering has been involved in three previous proposals for this facility. As part of the work on those proposals, and the Convention Centre, we visited and analysed the facilities at Cleveland, Minnesota and Edmonton.

We have in our files, the breakdown of capital and operating costs for the facilities in Minnesota and Edmonton. We have recently completed a structural study of Ivor Wynne Stadium for the City of Hamilton, and as a result are intimately familiar with this facility. We feel we have the Engineering experience and related project experience to make a positive contribution to this study.

References

Mr. D. Samson, P.Eng.	-	Vice-President Engineering Dominion Foundries & Steel Limited Hamilton, Ontario. (416) 544-3761
Mr. G. Kellner, P.Eng.	-	Ministry of Government Services Chief Mechanical Engineer Toronto, Ontario. (416) 965-2806
Mr. K. McIntyre	-	Vice-President Mohawk College (416) 389-4461
Mr. A. German	-	Architect City of Hamilton (416) 527-0241

Hanscomb Roy Associates

Sports Buildings

Stadia, including grandstands, for racing, baseball, football, etc.

P: Nepean Sports Complex, Ottawa
D: 1971
O: The Corporation of the Township of Nepean
V: $5,000,000
A: Hans L. Stutz
S: Cost planning and control

P: Athletic Facility, Peterborough
D: 1974
O: Trent University
V: $2,800,000
A: Prack Partners
S: Cost planning and control

P: Stadium/Sports Facilities, East York Collegiate
D: 1974
O: East York Board of Education
V: $2,100,000
A: Prack Partners
S: Preliminary estimates

P: Athletic Complex, Toronto
D: 1974
O: University of Toronto
V: $10,500,000
A: Prack Partners
S: Cost planning and control

P: Commonwealth Games Stadium, Edmonton
D: 1975
O: City of Edmonton
V: $15,000,000
A: Ragen, Bell, McManus & Associates
S: Cost planning and control

P: Taylor Field, Regina
D: 1976
O: City of Regina
V: Unknown
E: Reid, Crowther & Partners Ltd.
S: Estimates

P: Track & Field Training Facility, Toronto
D: 1977
O: York University
V: $2,500,000
A: Moffat, Moffat & Kinoshita
S: Cost planning and control

P: Icerink, Recreational & Cultural Centre, Omaha
D: Current
O: Leisuretime Centres Inc.
V: $79,000,000
A: To be determined
S: Project Management & Control Services

Economic Research Associates

Economic Research Associates (ERA) is a diversied consulting firm providing a wide range of analytical services in economics, finance, marketing, planning and management to both public and private clientale. More than 100 ERA professional and technical employees are operating from offices in Los Angeles, San Francisco, Dallas, Chicago, Orlando, Boston and Washington, D.C.

ERA's economic planning efforts for sports and performing arts facilities have been integral to the planning of spectator accommodations-stadiums, amphitheatres, auditoriums, movie houses, arenas, and theatres - and participant sports facilities which include ice and roller rinks, golf courses, swim and water sports areas, tennis and racquetball clubs and multi-activity areas.

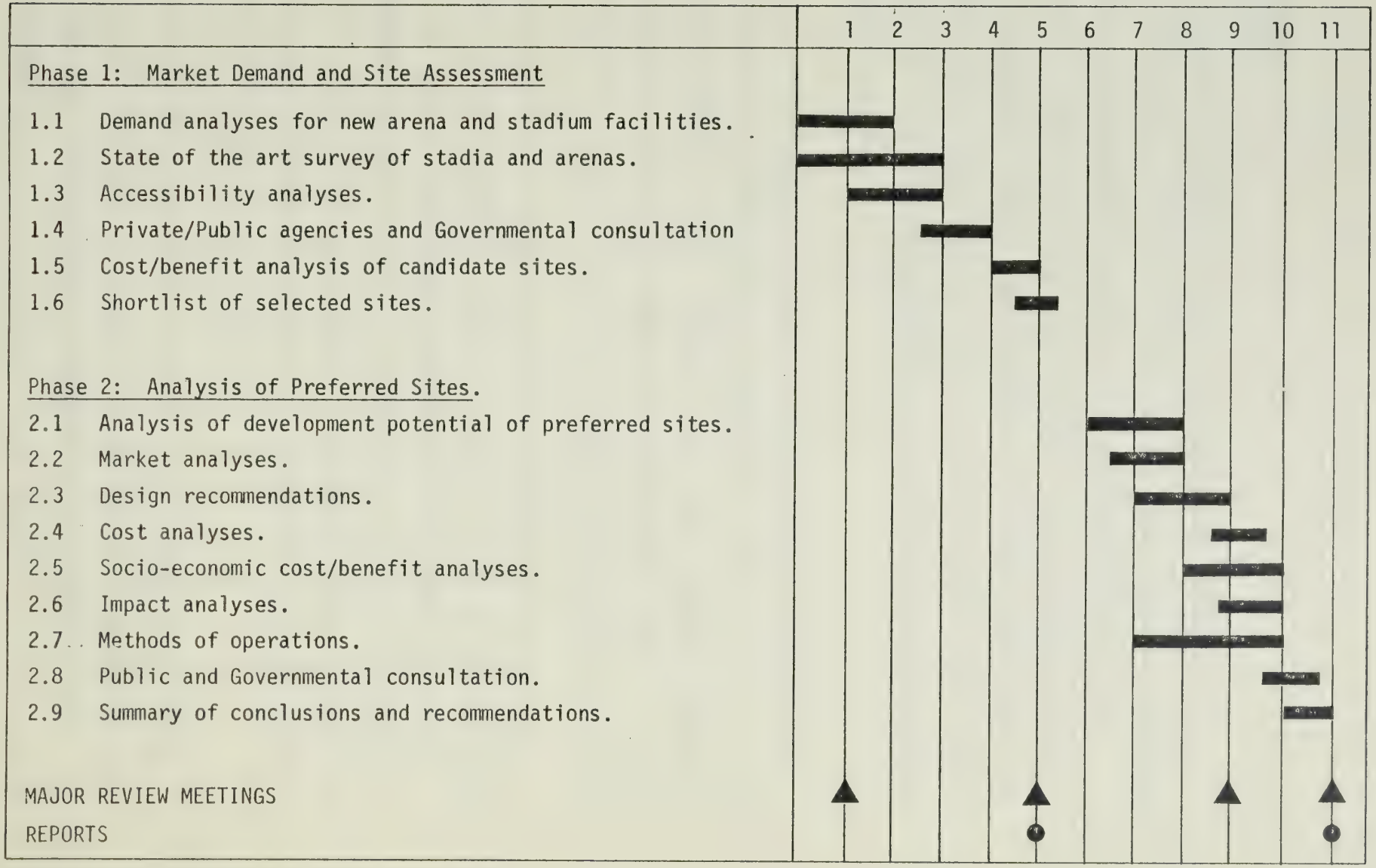
ERA carried out feasibility and operation studies for a large number of facilities including:

- The Superdome in New Orleans
- The Los Angeles Forum
- The Nassau County Coliseum
- The Boston Garden
- The Los Angeles Convention Centre
- Convention Facilities for Yerba Buena, San Francisco
- Blue Grass Convention Centre; Lexington Kentucky
- The San Diego International Sports Arena
- Philadelphia Sports Arena
- Radio City Music Hall
- Los Angeles Music Centre
- ABC Entertainment Centre

EXHIBIT 2

FEASIBILITY ANALYSIS FOR STADIUM/ARENA

TIME SCHEDULE IN WEEKS



TIMING AND COSTS

Following your written authorization, we would commence the assignment immediately. In order to carry out the work program as described, we will require approximately 10 working weeks and one contingency week. Consequently, in order to complete the assignment by the September 3, 1980 deadline, as indicated in the terms of reference, we would require authorization to begin work no later than the week of the 30th of June, 1980. Should authorization be forthcoming after this date, we would anticipate the deadline being delayed accordingly.

It is our practice to estimate an upset limit for each assignment and to bill against this budget at our standard hourly rate. Our out-of-pocket expenses for such items as travel, computer time, typing, graphics, printing, long distance calls, are also included in our proposed upset budget. In this case we are prepared to carry out this assignment for an upset fee of $74,500.

Our practice is to submit an invoice each month for our services, approximately two weeks after the end of the month in which the services were performed. The invoice is therefore submitted some four weeks, on average after the expenditures are incurred in providing the services. We therefore appreciate our clients understanding that our invoices are due on receipt. In light of the current and anticipated levels of interest rate we must require that our invoices be paid within 30 days.

We trust that this proposal meets your requirements. We will be happy to respond to any questions relating to our proposed work program, our firm, our study team, and our budget requirements to undertake this most challenging project.

APPENDIX "A"

RESUMES

NEAL ALEXANDER IRWIN

POSITIONS:

Managing Director	-	IBI Group
Chairman	-	InterBase Incorporated
Partner	-	Beinhaker/Irwin Associates Architects, Engineers, Planners
President	-	Neal A. Irwin Ltd.
Vice President	-	Teleride Corporation

MEMBERSHIPS:

Association of Professional Engineers of Ontario; British Columbia; Saskatchewan
Registered Consulting Engineer, APEO
Association of Professional Engineers, Geologists and
Geophysicists of Alberta
Engineering Institute of Canada
Institute of Transportation Engineers
Canadian Operational Research Society
Institute of Management Consultants of Ontario
Roads and Transportation Association of Canada
Chairman, Planning Committee, 1972 - 1975
Vice-Chairman/Chairman, Technical Council, 1975 -1979

EDUCATION:

B.A.Sc. (Engineering Physics), University of Toronto, 1955
Studied Economics and Political Science at University of Toronto, 1950-51
Special lecturer in Urban Transportation Planning, University of
Toronto, 1966-70

EXPERIENCE:

1974 - Present
Managing Director, IBI Group

1967 - 1974
Partner, Peat, Marwick and Partners, in charge of Transportation Planning, Management Sciences and Economics

1960 - 1966
Vice-President in charge of U.S. operations, Traffic Research Corporation

1957 - 1959
Canadair Ltd. and Atomic Energy of Canada Ltd. - Nuclear Design Engineer

1955 - 1957
Industrial fellowship in United Kingdon, designing nuclear power stations

1954 (summer)
Ontario Research Foundation - research assistant, pilot plant for direct iron ore reduction.

MILITARY SERVICE:

Commissioned Sub-Lieutenant, Royal Canadian Navy (Reserve) 1954.

Neal Alexander Irwin (Continued)

CONSULTING PROJECTS:

Mr. Irwin has directed a large number of transportation, technology assessment, resource planning, regional development, economic studies and traffic engineering projects on behalf of clients such as:

- Ministry of Transportation and Communications, Ontario
- Metropolitan Toronto Planning Board
- City of Toronto
- Canadian National Railways
- Ministry of State for Urban Affairs
- Canadian Ministry of Transport
- City of Regina
- Canadian Council of Resource and Environment Ministers
- Central Mortgage and Housing Corporation
- Corporation of Metropolitan Winnipeg
- Science Council of Canada
- Canadian Federation of Mayors and Municipalities
- U.S. Department of Commerce Northeast Corridor Project
- City of New York
- Port of New York Authority
- Tri-State Transportation Commission
- Regional Plan Association, New York
- Penn-Jersey Transportation Study
- U.S. Department of Housing and Urban Development
- Metropolitan Toronto Transportation Plan Review
- Private sector clients including utilities, financial institutions, commercial and industrial concerns.

PROJECT EXPERIENCE:

During the course of this work, Mr. Irwin has pioneered in the development of mathematical models for estimating future conditions and assessing the cost-effectiveness of alternative courses of action, and in their application as planning and management tools. He has designed and carried out public participation programs, seminars and attitude surveys as part of the planning process. He has developed and applied marketing models and corporate planning models on behalf of transportation companies and manufacturing concerns, has developed information systems and provided organizational and policy advice for private and public organizations, and has carried out a variety of economic analyses and studies. He has written and lectured widely in these fields.

Some of Mr. Irwin's engagements include the following:

Science Council of Canada.

- A study of proposed research and development to improve urban transportation.
- A study of promising subsectors of the transportation sector for the application of government purchasing policy and related levers to enhance an industrial strategy for greater levels of innovation and manufacturing employment in Canada.
- A study of the linkages between tertiary, secondary and primary sectors of the Canadian economy, with particular reference on the degree of dependence of service industries on manufacturing industries in this country.

Neal Alexander Irwin (Continued)

PROJECT EXPERIENCE: (Continued)

Pennsylvania Economy League, Inc. A study of improved organization for a major planning body.

Ministry of State for Urban Affairs - Urban strategy and related studies.

Canadian Federation of Mayors and Municipalities. A survey report on urban transportation problems and priorities in Canadian municipalities.

Transport Canada

- Consulting advice in the development of government strategies and related recommendations regarding a comprehensive study of the Role of the Automobile in Canadian society, including the economic, energy, environmental and service level implications of alternative courses of action.

- Assistance in the development of a new transportation policy for Canada, including extensive analyses of truck, rail and marine goods traffic, rail capacity, freight rates, economic implications of possible pricing/subsidy changes, the energy implications of various transportation system, and related matters.

- Development of an energy monitoring system for Transport Canada's operations.

- For the Transportation Development Centre of Transport Canada, a study of the indirect uses of energy in Canadian transportation. This study involved the determination of the amount of energy required to manufacture and maintain vehicles as well as the amount of energy required to construct, operate and maintain infrastructure.

- Multi-modal study of intercity transportation in the Atlantic Provinces.

- Strategic planning studies for the Toronto Airport system.

- Assistance in developing an information system for monitoring and forecasting energy consumption in each mode of transportation in the Province of Quebec (project carried out for Transort Canada in cooperation with the Quebec Development of Transportation).

- Traffic safety analyses on behalf of the Motor Vehicle Traffic Safety Bureau.

Saskatchewan Department of Highways and Transportation - The Regina Environs Transportation Study, a regional study of development and transportation/servicing requirements leading to a detailed implementation program showing alternative development and transportation strategies for the Region, and their social, environmental, economic and functional implications.

Neal Alexander Irwin (Continued)

PROJECT EXPERIENCE: (Continued)

Ontario Select Committee on Economic and Cultural Nationalism - A study of behavioural differences between Canadian-owned and foreign-owned firms operating in Canada, and related opinion research and policy analysis.

Toronto Transit Commission - A project for the testing and implementation of a system for monitoring and controlling the fleet of buses and streetcars, which is made possible by improved electronic systems for communications with vehicles, monitoring of vehicle locations and status, and storage/display of information. Design, implementation assistance, and evaluation of a 100-bus pilot project.

Ontario Ministry of Energy

- Planning for the development of a system for monitoring the performance of solar space heating and hot water demonstration systems. The monitoring system includes hardware specifications for data collection, storage and retrieval, and the development of formats for information dissemination.

- Assistance in the development of a manual of design guidelines for energy conserving residential buildings (carried out for the Ministry and the Housing and Urban Development Association of Canada).

Grains Group, Government of Canada - Directed the IBI Group portion of a major operations analysis of the transportation and handling of grain in Western Canada, leading to recommendations for improvements in railway operations, inventory management/control, and the institutional arrangements under which this complex system operates.

Ontario Ministry of Transportation and Communications

- Development of specifications for a comprehensive planning information system.
- Development of a simplified method for estimating the impact of transportation facilities on the distribution of urban activities.
- Consulting advice on the development of an information system and related forecasting modelling capability regarding freight movements in the Province of Ontario, including alternative means of achieving various levels of capability in this field and their estimated costs and benefits.

City of Toronto

- Study of use of Union Station as part of a multi-mode transportation terminal, and impacts on the development of the Metro Centre Lands.
- Development of a new parking and loading policy and by-law based on a comprehensive survey and analysis program.

Ministry of State for Science and Technology - Study of handicaps and benefits of technological innovation in Canada.

Neal Alexander Irwin (Continued)

PROJECT EXPERIENCE: (Continued)

City of Hamilton - Directed the Hamilton Transportation Strategy Study which postulated seven alternative land use/urban development concepts for Hamilton and surrounding areas, estimated transportation demand and interactions relative to each, assessed road and transit capacity implications by corridor, and commented on requirements for transportation improvements by mode for each urban development concept. Developed optimum traffic signal settings.

Hamilton Street Railway - Engineering, social, environmental, traffic and economic feasibility project to select the first rapid transit corridor for Hamilton.

British Columbia Department of Economic Development - Assessment of the potential for attracting freight and passenger traffic to and from the Pacific Rim countries to pass through British Columbia, the benefits and costs of such additional traffic, and required government initiatives.

National Capital Commission - Preliminary feasibility study and planning for a rapid transit line to serve a high density Interprovincial Corridor through both the Ottawa-Carleton and Outaouais portions of the National Capital Commission.

Regional Municipality of Ottawa-Carleton - Preliminary feasibility study; planning and impact analyses to establish priorities, recommend alignment, type of technology and staging; and development of pre-design concepts for stations of a Light Rapid Transit System for the Region.

A Major Canadian Potash Producer - An extensive assessment of alternative means of improving the reliability, responsiveness and financial performance of a potash distribution system leading to detailed recommendations and a proposed strategy for improvements.

City of Edmonton - Feasibility and planning project for the introduction of a computer-controlled traffic signal system and automatic bus monitoring system. Assistance in study design preparation for a major rail relocation and urban development program. Advice regarding annexation plans.

Ontario Royal Commission on Electric Power Planning - Estimates of the market penetration of solar heating for residential, commercial and industrial space and water heating in the Province of Ontario to 2021, including implications regarding savings in electrical and other conventional energy.

City of Calgary - Predesign studies, design and implementation of a light rapid transit line serving the South Corridor of Calgary, including alignment selection, operational analyses, environmental impact assessment, financial/costing analyses, station design, station site planning, trackwork, design of a bus garage and LRT garage/shops, and related civil works. IBI Group's involvement in this project is as a member of a three-firm consortium; Mr. Irwin serves as the representative of IBI Group on the three-man Consultants' Executive Committee for the project, which has an estimated duration of over four years.

PROJECT EXPERIENCE: (Continued)

Municipality of Metropolitan Toronto - A variety of consulting assistance, including the development and installation of a computer-controlled traffic control system; development and application of a sophisticated multimodal travel demand forecasting model; ridership estimates, operational planning and predesign services for improved GO Transit rail commuter services; development and application of a truck movement forecasting model; planning and financial studies for the introduction of demand-responsive dial-a-bus services; and a variety of related land use and transportation planning activities.

Atlantic Development Board - Participation in a major study of tourism and recreation in the Atlantic Provinces including detailed surveys and inventories of demand levels and available facilities, assessment of the financial capabilities of hotels, motels and other establishments, forecasting of travel to and from the Atlantic Provinces and other parts of North America, and master plans for selected park areas throughout the Atlantic Provinces.

Ontario Ministry of Information and Tourism - A series of tourism and recreational studies including the development and initial application of a comprehensive model of tourism/recreational demand and supply in the Province of Ontario (the Tourism and Outdoor Recreation Plan Study); a study of fly-in visitors to Northwestern Ontario; and a planning study for improved recreational facilities in the Patricia/Rainy River area of Northwestern Ontario.

Ontario Royal Commission on the Northern Environment - Consulting advice regarding existing and anticipated transportation and communications services in the far north of Ontario, and related questions.

Alberta Transportation

- Extensive surveys of travel behaviour and development of forecasting model capability regarding intercity person-travel and traffic flows.

- An assessment of the viability of an inland container terminal to serve goods movement to, from and through Alberta.

New Town of Milton-Keynes, United Kingdom - Master planning for the transportation system of this major new town (population 250,000), including street layout, transit facilities/services, and provision for continuing expansion of capacity and services over time.

Alberta Department of the Environment - Study of the optimum alignment and related characteristics of an oil collection pipeline system north of Edmonton, with particular emphasis on minimizing adverse environmental impacts.

Neal Alexander Irwin (continued)

PROJECT EXPERIENCE: (Continued)

City of Niagara Falls - Development of a comprehensive zoning by-law, including public meetings and subsequent drafting of the by-law.

Canadian National Railways - Transcontinental passenger marketing survey, including a major behavioural and attitudinal survey of persons travelling by rail, bus, air and automobile interprovincially across Canada (sample size: 4000), development of a wide variety of possible transcontinental passenger services tailored to the attitudes and requirements of travellers, demand estimates and financial assessment of alternative transcontinental passenger services, and recommendations for the development of improved services.

A Major Electronics Manufacturer - Marketing study of the likely demand for existing and possible new products in the traffic control field, including recommendations for the development and marketing of a new line of equipment involving the use of computer technology in urban traffic control.

A Manufacturing Company - Market assessment regarding diversification into new products in the transportation field.

A Major Public Utility Consortium - Socio-economic inventories and extensive interviews on the possible impact of a proposed pipeline on relevant communities in Canada's North.

A Major Public Utility - Assistance in developing and using a corporate planning model.

Management Board of Cabinet, Government of Ontario - A study of the financial prospects and related aspects of the Ontario Northland Transportation Commission, including development and application of a detailed financial model to assess the impact of cost increases of various types, varying rate structures, different debt equity ratios and financial instruments, and various subsidy formulae. Recommendations were made on a new financial structure, corporate structure and subsidy formulae to improve the efficiency and effectiveness of the transportation commission, which includes rail, truck, ferry, air, communications and tourism services.

Ontario Ministry of Agriculture - A broad assessment of the agricultural industry in Canada, from the point-of-view of economic viability, land use, rural socio-economic development, foreign exchange, and food self-sufficiency.

Agriculture Canada

- A study of energy-conserving greenhouse designs and their possible application in various parts of Canada, including an assessment of the economics of vegetable and flower production in greenhouses and the impact of rising energy costs on the viability of such enterprises.

- Advice on grain policy.

Neal Alexander Irwin (Continued)

PROJECT EXPERIENCE: (Continued)

A Major Gas Utility - Design development for an energy conserving greenhouse utilizing waste heat from gas compression turbines.

National Research Council - Development of a system for monitoring solar heated buildings, including specifications and costing of hardware for sensors and the central storage/retreival system, design of software, and provision for retrieval of detailed information by interested users from the central system via computer terminals.

City of Winnipeg - A variety of projects including traffic engineering and control improvements, forecasting of travel demand for alternative road and transit systems, application of a land use model for estimating future growth patterns, and developing standards of transportation service for both roads and transit.

City of Halifax - Design and implementation of a traffic management centre aimed at imporved traffic flow through both demand management (flexible hours, flexible pricing) and supply management (traffic engineering measures, improved transit and para transit services, better integration of planning and operations for all modes of transportation),

City of Saskatoon - Design of a computer-controlled traffic signal system.

RUSSELL GWILLIAM

POSITIONS:

Director - IBI Group
Director - InterBase Incorporated
Partner - Beinhaker Irwin Associates, B.C.
President - Russell Gwilliam Ltd.

MEMBERSHIPS:

Member of the Canadian Institute of Planners
Fellow of the Royal Town Planning Institute
Fellow of the Royal Institution of Chartered Surveyors.

EDUCATION:

B.Sc. (Honours) King's College, University of London, 1952
School of Military Survey (Survey and Land Law), 1952-53
Post Graduate Diploma, Town Planning, Victoria University, Manchester, 1961.

AREAS OF SPECIALTY:

Urban and regional planning, including official plans and zoning by-laws, socio-economic studies, planning and impact analysis of major developments. Environmental assessment, land use planning policy at all levels; housing; tourism and recreation.

Airport system planning; transportation policy; energy studies.

AWARD:

Heywood Silver Medal for Town Planning

EXPERIENCE:

1973 - 1974
Partner, Peat, Marwick and Partners, responsible for Urban/Regional Planning and Resource Development

1971 - 1973
Director, Urban/Regional Planning and Resource Development

1969 - 1971
Senior Consultant, Peat, Marwick and Partners

1963 - 1969
Chief Planning Officer, Sarawak, Malaysia

CONSULTING PROJECTS:

Mr. Gwilliam has directed and played a significant role in a large number of urban, regional, resource planning, property development, property management, economic and transportation projects on behalf of such clients as:

- Ontario Ministry of Transportation and Communication
- Transport Canada
- The Ontario Ministry of Treasury, Economics and Intergovernmental Affairs

Russell Gwilliam (Continued)

CONSULTING PROJECTS: (Continued)

- The City of Mississauga
- The Pennsylvania Economy League (SEPTA)
- The Ontario Ministry of Housing
- Public Works Canada
- The City of St. John
- The Ontario Ministry of Industry Trade & Commerce
- The Ontario Law Reform Commission
- The Alberta Department of the Environment
- Metropolitan Toronto
- The Greater Vancouver Regional District
- The Department of Regional Economic Expansion
- Ministry of State for Urban Affairs
- A number of private clients involved in real estate including housing, commercial and hotel, industrial and resort development
- The Regional Municipality of York
- Harvey Township
- Environment Canada
- The Town of Pickering
- The Regional Municipality of Haldimand-Norfolk
- Town of Thornbury
- Town of Newcastle
- Town of Midland
- The City of Regina
- The Ontario Ministry of Energy
- The Royal Commission on Electrical Power Planning
- Fisheries and Oceans, Canada
- City of Cambridge
- City of Port Colborne
- Ontario Land Corporation
- Nova Scotia Ministry of Mines and Energy

RELEVANT CONSULTING EXPERIENCE:

City of Cambridge - A feasibility study and development program for a key 25 acre site south of Highway 401 in the City of Cambridge. Market analyses were undertaken, and alternative conceptual development programs prepared within a framework of policy established by the City. These were subjected to financial analysis, and also reviewed with representatives of the development industry and potential operators. A development program involving a major hotel and associated facilities, office, and prestige industrial park uses was recommended which was accepted by the City Corporation, and a detailed call for proposals from potential developers prepared.

Scarborough Town Centre - For Public Works, Canada, a feasibility study of the development potential of a six acre site in Scarborough Town Centre. This involved determining market demand for a variety of uses, including office, cinema, commercial, restaurant, fitness club and residential; developing concepts, and preparing financial pro forma for four alternative schemes to determine the highest and best use within constraints imposed by planning requirements.

RELEVANT CONSULTING EXPERIENCE: (Continued)

Ontario Land Corporation - An evaluation of site potential and residential housing demand on a major land holding in the City of London. A comparative market analysis was undertaken, demand forecast, and a marketing and development program for the next 2 years recommended.

Retirement Housing - Market and Financial Viability Analysis - On behalf of a Toronto-based multi-function developer, Mr. Gwilliam directed a marketing study in order to establish the demand and economics of retirement housing aimed at accommodating the Dutch Community in South Central Ontario. Based on the results of this study the Dutch Community is presently determining the most appropriate location for this development.

Bowmanville, Town of Newcastle - Market analysis of retail, office and hotel demand in the Bowmanville Urban Area in preparation for two hearings of the Ontario Municipal Board.

Economic Base, Northwestern Ontario - For a major private sector client, preparation of an economic base study (to 1977) for Northwestern Ontario including the District of Thunder Bay.

New Toronto Airports Project - Director responsible for the overall co-ordination of our work as principal consultants to the Canadian Air Transportation Administration on this project. This included major surveys of the socio-economic and behavioural characteristics of air travellers involving 16,000 personal and mail surveys.

General Aviation Survey, Toronto International Airport - A major survey of General Aviation use of TIA, which collected information specifically related to the economic importance of general aviation including business/ pleasure/ other uses; employment category of passengers; industrial classification of major business users in addition to information relating to movements by time of day, aircraft type, IFR and VFR etc.

Toronto Island Airport: Users Survey - A survey to establish a socio-economic profile of users of the Toronto Island Airport, Through a mail-out questionnaire, some 400 users were analyzed and data was collected for their socio-economic characteristics, purpose of use of aircraft, origin and destination, etc.

Toronto Area Airports Project - Directed our effort as principal consultants to this project from 1970 to 1977. Directly responsible for all studies related to economic and social impact of airport development. Responsible for preparing the Federal Government submission to the Airport Inquiry Commission, including the co-ordination of the work of several consultants and members of the Federal Airport Team.

Proposed Darlington Generating Station - A review of Environmental and Community impact of the development of the proposed Generating Station, undertaken on behalf of the Town of Newcastle. Assistance was also provided to the Town in negotiating an agreement with Ontario Hydro to provide financial assistance to the Town in managing growth. Ongoing assistance is being provided to develop the appropriate procedures to monitor growth, and establish the organization required by the Town to manage that growth.

RELEVANT CONSULTING EXPERIENCE: (Continued)

New Community Impact Study - Analysis of the financial, social and environmental impact of a major new resort community in Harvey Township.

Town of Thornbury - Evaluation of the physical, social, financial and environmental impact of a proposed major resort development in the Town of Thornbury. This study involved an attitude survey of the citizens of Thornbury.

Pickering Town Centre Study - This study was undertaken to identify the location and new components for the Town Centre of Pickering. This included a regional shopping centre, office campus, civic complex, community facilities and family housing. A major aspect of this work was the evaluation of various sites competing for the designation as the centre location. Additionally, development guidelines were produced for the selected site.

Mississauga City Centre - Analysis of a number of competing sites for the future City Centre of Mississauga involving socio-economic and design criteria.

Hotel and Resort - Feasibility studies for a number of interests.

Ontario Ministry of Education - Pilot survey of leisure time activities.

Regional Municipality of York - Analysis of economic propects and forecasts of employment for the Regional Official Plan.

Regina Industrial Development Strategy - Director of a major current study to develop a comprehensive Industrial Development Strategy for the City of Regina. This involves preparing forecasts of future industrial employment; land; infrastructure; and transportation requirements, and developing appropriate growth management policies and mechanisms including Official Plan and Zoning By-law designations and the implications for the five-year capital budget. The major areas for expansion of industrial development have been selected, and conceptual designs prepared as the basis of costing hard services.

Malaysia - Preparation and implementation of a number of downtown redevelopment programs, including Sibu, a Town of some sixty thousand people, which included replanning of the waterfront to accommodate a variety of port, commercial and recreational uses, and the reaccommodation of existing residents.

Energy Conservation Through Land Use Decisions - For Environment Canada, a study of the methods through which energy conservation can be achieved by making proper land use decisions. This included a literature review and an analysis of major planning issues with respect to energy conservation.

Solar Energy Monitoring System - A recent major assignment for the Ontario Ministry of Energy to determine the information requirements of individuals and groups involved in the development and application of solar energy and develop appropriate systems for monitoring the performance of solar energy demonstration projects.



Russell Gwilliam (Continued)

RELEVANT CONSULTING EXPERIENCE: (Continued)

Ontario Royal Commission on Electrical Power Planning - Estimates of market penetration of solar heating in Ontario. Panelist in a seminar organized by the Royal Commission on alternate (non-conventional) energy sources.

Small Craft Harbours, Maritime Provinces - The development of the 5 year program for fishing and recreation harbours in the Maritime Provinces in relation to the expanded recource availability resulting from the declaration of the 200-mile limit and improved resource management practices. The 5 year program for well in excess of $100 million is related to the development of new facilities; repair and reconstruction program and on accelerated maintenance program.

Small Craft Harbours, Ontario - The development of a similar through very much smaller program for fishing harbours on the Great Lakes in Onario.

LAURENCE SHERMAN

POSITION:

Director - IBI Group
Associate - Beinhaker/Irwin Associates

MEMBERSHIPS:

Member, Canadian Institute of Planners
Member, Community Planning Association
Registered Architect, Commonwealth of Pennsylvania
Certified, (U.S.) National Council of Architectural Registration Boards

EDUCATION:

Master of Architecture, University of Pennsylvania, 1964
Master of City Planning, University of Pennsylvania, 1963
Bachelor of Architectural Engineering,
Washington State University, 1956

EXPERIENCE:

1975 to Present
Director, IBI Group

1969 - 1974
Partner, Peat, Marwick and Partners

1963 - 1968
Philadelphia City Planning Commission, including Staff Director,
Federal Model Cities Program

1959 - 1968
Professional practice as an urban planner and architect.

Laurence Sherman (Continued)

PROJECT EXPERIENCE:

The following is a summary of design, planning and programming projects carried out under the direction of Mr. Sherman:

- Program and planning for the development of the new Lady Minto Hospital at Cochrane, including the role study, the master plan, functional plan, design and construction management; this $4.7 million project is now under construction.

- Programming and master planning of the Sensenbrenner Hospital, Kapuskasing.

- Preliminary programming and planning for the development of a community out-patient health centre in Mississauga, Ontario.

- Programming and master planning (MP6) for the expansion of Sunnybrook Hospital.

- Preliminary program and master plan for improvements and expansions to Scarborough General Hospital.

- Program/master planning for the development of Dawson College (community college including nursing) in downtown Montreal.

- Master planning and expert witness before the Ontario Municipal Board on behalf of the University of Toronto.

- Planning and design of social, non-profit housing for the Department of Housing, City of Toronto.

- Urban Transportation Development Corporation (UTDC): Environmental impact and public acceptability of new intermediate capacity transit systems.

- Regional Municipality of Ottawa-Carleton: Effect of regional rapid transit in terms of land-use and environmental impact.

- City of Ottawa: Urban design for a multi-use major activity centre to serve the South Ottawa district.

- City of Mississauga: As part of the official plan review, development of a plan for multi-use community service centres throughout the City.

- Town of Pickering: Land-use planning impact and urban design of a new town centre.

- Flint Michigan: Intermodal facility study incorporating functional planning for site selection to provide bus/rail passenger and freight facilities.

Laurence Sherman (Continued)

PROJECT EXPERIENCE: (Continued)

- New Montreal International Airport (Mirabel): Land-use and development programmes and plans for the environs surrounding the new airport.

- City of Regina: Land-use planning and urban design components of the Regina environs transportation study.

- City of Regina: An analysis of the land-use implications of the Regina Tele-Bus system; research sponsored by the Federal Transportation Development Agency.

- City of Regina: Preparation of land-use and development plans for the North-west and South-east Sectors of the City, totalling some 6,500 acres and subsequently, preparation of Phase 1 Outline Plans and subdivision designs for the Saskatchewan Housing Corporation and Cairns Homes Ltd.

- City of Toronto: The urban design and land-use planning component of a feasibility study for retaining Union Station as part of a multi-use Metro centre development project.

- Land-use planning projects involving a number of official plans and zoning by-laws in Ontario for municipalities including Whitby, Niagara Falls, Wasaga Beach, Durham Region, Richmond Hill, Toronto and Ottawa.

- Parks Canada: Masterplan for Lake Louise, Banff National Park.

- University of Toronto: Master plan, space program and schematic design for a building complex to accommodate the Earth Science Departments and key student services.

- Program and design for redevelopment of the Regina Union Station as a multi-modal transportation terminal, including the City's new bus station, the VIA passenger station, and a wide range of support facilities.

- Town of Weyburn, Saskatchewan downtown redevelopment and main street urban design.

- Community plans for Deuro Holdings Ltd. Regina.

David C. Petersen

- Vice President, Economic Research Associates
- Manager, ERA's Orlando Office.
- Experience in Financial and Market Feasibility Studies for Sports and Convention Facilities:
  - New Orleans Superdome
  - Los Angeles Forum
  - Los Angeles Convention Centre
  - Boston Garden
  - Convention Facilities, Yerba Buena, San Francisco
  - Nassau County Colliseum, N.Y.
  - Blue Grass Convention Centre, Lexington, Kentucky
- During an 18 month leave of absence from ERA, Mr. Petersen was in charge of the operations of the Orlando Arena & Convention Centre, in Orlando Florida.
- Mr. Petersen served as the Director of the Lexington Centre Corporation which controls and operates a large arena and convention centre in Lexington Kentucky. This is a new facility which started to operate in 1975.

JOSEF GER

POSITION:

Senior Consultant - IBI Group

EDUCATION:

Bachelor of Applied Arts, Ryerson Polytechnical Institute (1977).

AREAS OF SPECIALTY:

Financial Analysis
Real Estate Economics
Market Research
Locational Analysis
Quantitative Research
Systems Design

EXPERIENCE:

1977 to Present

Consultant - IBI Group

1977

Independent Consultant

PROJECT EXPERIENCE:

IBI Group

Muskoka Resort Development - Market Feasibility and Development Program - On behalf of a major cooperative company, Mr. Ger carried out a market analyses of vacation trends in the Muskoka vacation area with a view of providing information on the market and financial viability for the redevelopment and expansion of a major resort hotel and associated recreational facilities located in the prime vacation area of the Muskoka region. The results of the viability study served as input to a full refurbishing and improvement effort with a view of servicing the expected future increase in vacation and business markets flowing to this region.

Multiple Use Commercial Development - Market Feasibility and Financial Viability Analyses - On behalf of the Corporation of the Municipality of Cambridge, Mr. Ger directed the project with a view of determining a market and financially viable mix of uses for a 25 acre (10 hectares) municipally owned site within viewing distance of Highway 401 in the Municipality of Cambridge. Throughout the analysis the potential for hotel, convention centre, office complex, and light industrial research park was analyzed. The financial viability and marketability of each of these land use components was tested through a comprehensive review of the market demand for such facilities in light of tourism and convention patterns, general regional economic trends, business and industrial growth requirements in the region. The results of the analysis were translated into development recommendations and an implementation program has been adopted by the Municipality's Council, which was followed by a call for development proposals to be reviewed by the Municipality in light of the research findings.

Josef Ger (Continued)

PROJECT EXPERIENCE (Continued)

Town of Vaughan - Housing Study - As sub-consultants to a consulting team working for the Town, acted as Project Manager in the preparation of estimates of future demand for housing in the Town, to determine the adequacy of present designations of residential land.

Major Housing Development - Market Research and Financial Assessment - On behalf of a major western Canada land developer, operating in the Toronto region, a full market demand and financial viability study was conducted for the purpose of developing the most appropriate housing mix which also achieved the highest financial return. The results of this research has been integrated into the physical planning of this new subdivision.

Retirement Housing - Market and Financial Viability Analysis - On behalf of a Toronto-based multi-function developer, Mr. Ger carried out a marketing study in order to establish the demand and economics of retirement housing aimed at accommodating the Dutch Community in South Central Ontario. Based on the results of this study the Dutch Community is presently determining the most appropriate location for this development.

Residential Development - Market Study - The objective of this study was to determine the basic parameters of demand by housing type, price and size. This study was carried out on behalf of a major multi-national oil company engaged in land development in Mississauga, Ontario. The results of this effort indicated the most appropriate phasing for this development, in line with the demand and financial return expectations of the client.

Shopping Centre Development - Market Assessment - On behalf of the Town of Newcastle, Mr. Ger carried out a major market analysis to determine the demand for size and location of shopping facilities. These would be required to serve the present and future planned populations of the Town of Newcastle.

Office Development - Market Analysis and Financial Return - Acting as the day-to-day project manager, Mr. Ger carried out a full market assessment of the demand for office space in Scarborough. On behalf of the Federal Government, this study determined the demand for and absorption rate of office space and related commercial facilities in the Scarborough Town Centre, Scarborough, Ontario. The results of the market analysis were presented in the form of financial yield scenarios, showing various combinations of uses in order to determine the highest and best return condition.

Major Retirement Community - Market Research and Financial Viability Study - This project involved a complete analysis of market research data assembled through personal interviews and a review of similar projects, for the purpose of establishing the market acceptability, the form desired by the market place and the financial viability of this project. The assembly of data retrieved from these sources establish the basic characteristics which would be associated with this development; these characteristics were then costed and translated into a number of alternative financial

PROJECT EXPERIENCE: (Continued)

scenarios which yielded estimates of equity requirements at various stages of the development process and the various sources of revenues to be expected over the period of the analysis. The research presented, to the Principals, the information required for financial planning and for decision making under conditions of purchase offers.

Municipal Impact Monitoring Project - Acting as the day-to-day research team manager, the project's objective was to establish an updatable baseline data system and source of planning data resources for the purpose of monitoring the impacts of the construction and operation of a major hydro generating station on the local community. As a result of this project a data base of population, housing and the full range of municipal services offered by the Municipality was established and the impact monitoring program has been implemented.

Major Pipeline Project - Member of a study team producing a socio-economic baseline and impact study of the Northwestern Ontario Region. This project evaluated the impact of the proposed Polar Gas Pipeline on communities within the Region. Involvement included the compilation, analysis and projection of future populations, labour force, incomes and income distributions.

Residential Market Analysis - Projects involved the assembly and analysis of residential land values in the Quebec City area and in the Hull area for the purpose of establishing potential markets which were related to socio-economic characteristics of the population and ownership patterns. The resulting analysis provided the developers with the decision-making factors necessary to develop the project concept, its economic viability and marketability.

Independent Consultant

Market Research System Design - On behalf of the Bramalea Group developed a market research data system to compile and retrieve data on consumer preferences by: socio-economic characteristics, residential design preferences and market targeting. The research, using consumer surveys, examined the attitudes of new home purchasers towards investing in various energy saving devices.

Commercial Location Analysis - Research intended to provide developers with an assessment of locational attributes related to commercial land. The analysis provided owners with a source of information which examined the viability of shopping plaza development with a view of future area development, traffic patterns and potential tenancy by type of users.

JOEL S. ROSEN

POSITION:

Affiliate - IBI Group
Principal - J.S. Rosen Management Consultants

MEMBERSHIPS:

Institute of Management Consultants of Ontario
The Travel Research Association

EDUCATION:

B.A. - Hotel, Restaurant and Institutional Management
Michigan State University
East Lansing, Mi., 1973

A.A.S. - Hotel Administration
Paul Smith's College
Paul Smith's, N.Y., 1971

AREAS OF SPECIALTY:

Recreation Facilities
Master Planning
Development Strategies
Attractions Planning and Management
Market Studies
Financial Feasibility Studies
Socio-Economic Impact Studies

Marketing
Market Research and Analysis
Surveys
Marketing Strategy Studies
Communications Programs

EXPERIENCE:

February 1979 - Present
J.S. Rosen Management Consultants, Principal

1975 - 1979
Frank Wolman Associates, Senior Consultant

Joel S. Rosen (Continued)

1975
Transport Canada, Project Consultant

1973 - 1974
Laventhol & Horwath, Consultant

PROJECT EXPERIENCE:

Yukon Tourism Development Strategy - Member of study team that examined and analyzed the potential for developing tourism in Yukon and recommended a strategy for implementing development opportunities. The study considered alternative development opportunities, theme attractions, tourist corridors, impacts of tourism development, manpower requirements and training, financial assistance, grading and standards, heritage legislation, on-going research needs and private and public sector roles. In addition, a detailed analysis of highway service centres was undertaken and policies and guidelines relating to Yukon highways were recommended.

Action Plan - Yukon Tourism Response to the Alaska Highway Pipeline - Member of study team that identified the expected impacts on tourism in Yukon of the Alaska Highway Pipeline during the pre-construction and construction period. Responsive actions were recommended.

Development Strategy for the Commercial Sector of Wasaga Beach, Ontario - Assisted in coordinating and conducting field research. This study examined the potential for developing viable tourist related commercial businesses, a community shopping centre and analyzed the feasibility of a year-round resort hotel.

Economic Impact, Market and Financial Feasibility Study - The Ontario Congress and Trade Centre - Project Manager for the Canadian component of this study which evaluated the market demand, financial feasibility and economic impact of a proposed convention and trade show facility for Metropolitan Toronto. The study examined the number and type of events that could be booked into the proposed centre, total market penetration, the competitive position of existing and proposed centres in Metropolitan Toronto, Canada and the United States, visitor expenditures, projected operating revenues and expenses and economic benefits in terms of income and employment, creation of new businesses and increased tax revenues.

Site Analysis and Feasibility Review: Grist Mill Theme Park, Nigadoo, New Brunswick - Project Director. Visited the site location, inspected the grounds and physical facilities, reviewed tourist travel routes and analyszed previous feasibility studies to determine the potential of developing a tourist attraction around a Grist Mill theme.

Joel S. Rosen (Continued)

PROJECT EXPERIENCE: (Continued)

Financial Incentives Program for Tourism Development, New Brunswick - Member of study team providing marketing and financial advice to the Department of Tourism, New Brunswick, with respect to applications from the Private sector for financial assistance under its program for tourism development. These included hotels, motels, country inns, resorts, restaurants, museums, tour and cruise boats, golf courses, baseball and tennis facilities, yacht clubs, marinas, outfitters, theme parks, community centres and a race track grandstand.

Feasibility and Operational Analysis for a Proposed Cruise Boat: Lake Temagami, Ontario - Project Director. This study analyzed the market potential and financial feasibility of establishing a cruise boat on Lake Temagami. It included an analysis of the local market, its economy and history, weather and its effects on the proposed cruise boat, navigational hazards and route alternatives, docking points, market segmentation and analysis, boat capacity and size, capital facilities and dock-site improvements, and government safety regulations. In addition, a detailed operating plan and promotional program were prepared.

Feasibility and Operational Analysis for the R.M.S. Segwun: An Historical Steamship - Member of study team analyzing the market potential and financial feasibility of restoring this vessel to operate regularly scheduled runs on Lake Muskoka.

Pre-Opening Program for Developing Canadian Hotel Company - Project Director. Prepared an in-depth schedule of pre-opening activities during the construction phase and grand opening for a newly developing Canadian hotel chain. This included liaison with the U.S. based franchiseor, preparation of marketing and promotional plans, selection and coordination of furniture, fixtures and equipment, review of kitchen layout and design, development of menu concept, and supervision of purchasing.

Site Analysis and Market Studies for Private Developer - Conducted site studies and analyzed market potential to develop budget motels in six Ontario cities.

Market and Financial Analysis for Walton House - Project Coordinator. This study examined the apartment hotel market in Toronto and identified the need to establish a "budget" type hotel in downtown Toronto. This study formed the basis for converting this project already under construction to Delta's Chelsea Inn.

Feasibility Study for a Fast-Food Restaurant - Project Coordinator. This study, undertaken for an international restaurant chain, examined the market potential and financial feasibility of establishing a fast-food restaurant in the east end of Toronto.

Ski Resort Facilities - Reviewed ski resort facilities, user charges and real estate prices for chalet development in the Collingwood - Thornbury area for a private developer.

Joel S. Rosen (Continued)

PROJECT EXPERIENCE: (Continued)

Market and Financial Feasibility Study for a Resort Hotel - Member of study team that analyzed the market potential and financial feasibility of a proposed resort hotel in the Muskoka region of Ontario.

Market Study for a Luxury Hotel in Downtown Toronto - Project Coordinator. This study examined the market potential to develop a luxury hotel as part of the College Park complex in downtown Toronto. The recommendations indicated the need for trade facilities similar to those that are presently being established.

Hotel and Restaurant Site and Size Requirements for a Multi-Use Complex - Prepared specific size requirements with respect to all aspects of developing a hotel in downtown Toronto as part of a major multi-use complex.

Market and Feasibility Study for a Convention Hotel - Conducted a study for a private developer to evaluate the site location market potential and financial feasibility for a proposed convention hotel. The proposed facility would have 1000 rooms plus a major exhibit hall of 25,000 square feet. This study considered two alternative sites in Metropolitan Toronto.

Taylor Field, Regina, Saskatchewan - Member of a study team that examined the feasibility of expanding this football stadium. Conducted market analysis with respect to attendance patterns and ticket revenues.

Operational Review of Small Hotel - On behalf of the owner of this 120 room property, a review of hotel and restaurant procedures was carried out. A cost control manual was prepared and presented to the owner and management, and assistance was provided during the implementation stage.

Marketing and Communications Program for an Independent Restaurant - Developed marketing program, prepared communications materials, directed production and costed and placed media in conjunction with the restaurant's owners and general manager.

Market Study for a Small Hotel in Brampton - This study conducted for a private developer examined the potential market for establishing a hotel in downtown Brampton.

Turn-Around Strategy for an Independent Restaurant - A popular Toronto restaurant having trouble meeting the required 50-50 ratio of food sales to liquor sales was placed on probation by the LLBO. A review of existing operations indicated that changes in management, coupled with improvements in food quality and consistency, a new menu and greater emphasis on promotion provided a framework for getting this operation to meet the required ratio.

Financial Projections for Hotel and Restaurant Projects - Prepared budgets and financial projections based on market information provided by Clients.

Financial Analysis for the Sale of Resort Hotels - Reviewed financial statements for private investors interested in purchasing resort hotels in the Orillia and Muskoka regions.

EITAN OREN

POSITION:

Senior Consultant - IBI Group

EDUCATION:

M.E.S., Master in Environmental Studies, 1973, York University, Toronto
B.A. (Economics/Political Science), 1969, Tel-Aviv University, Tel Aviv.

AREAS OF SPECIALTY:

Mr. Oren specializes in systems and urban planning as well as tourism and recreation analysis.

MEMBERSHIPS:

The Travel Research Association (TTRA)
Ontario Municipal Recreation Association (OMRA)

PROFESSIONAL EXPERIENCE

1974 to Present
IBI Group, Toronto - Senior Urban/System Planner. Responsible for conducting studies in urban planning and economic analysis; tourism and recreation planning; survey design and analysis; system planning in urban transportation.

1974
Peat, Marwick and Partners, Toronto - Urban/Facility Planner. Engaged in economic assessment as part of housing demand studies; space planning for various facilities.

1973
K. L. McReynolds Ltd., Design Research Consultants, Thornhill, Ontario - Planning and Research Analyst. Participated in a planning and research project of three medium security penitentiaries in Ontario and Nova Scotia, including survey design and analysis, activities analysis and space planning.

1972
Mazor-Katz, Architects and Urban Planners, Tel-Aviv - Facility Planner. Engaged in a study of a local home for the aged including users survey, space planning and functional programming of the institution.

CONSULTING CLIENTS AND
AREAS OF INVOLVEMENT

- City of Cambridge	• Feasibility of hotel/convention/ exhibition complex
- Department of Fisheries and Oceans, Small Craft Harbours Branch	• Recreation harbours development program, Maritime Provinces • Fishing harbours development program, Ontario
- Transportation Development Agency/Mississauga Transit - Tel-Aviv Transit	• Operation assessment; monitoring and analysis of communication, control and information systems
- Transport Canada	• Analysis of the impact of air transportation on the tourism industry in the Toronto Region
- Urban Transportation Development Corporation	• Environmental impact analysis and public acceptability of elevated Intermediate Capacity Transit Systems (ICTS)
- Ministry of Transport	• General aviation survey at Toronto International Airport • Assessment of business aviation activity at the Toronto Region • Toronto Island Airport users survey
- Regional Municipality of Haldimand-Norfolk	• Review of the Official Plans of the Towns of Port Dover, Simcoe and Caledonia
- Ontario Ministry of Housing	• Analysis of housing needs in Central Ontario
- Beer Sheva Home for the Aged, Israel - Parkwood Hospital, London, Ontario	• User studies, space and functional planning and evaluation of physical facilities
- Tel-Aviv University	• Campus master planning

PROJECT EXPERIENCE:

TOURISM AND RECREATION PLANNING

City of Cambridge: Feasibility Study of
Hotel/Convention/Exhibition Complex

A feasibility study of an hotel/convention/exhibition facility in the City of Cambridge and its economic viability. The analysis is part of a development program for 25 acres of industrial and commercial land. Mr. Oren carried out a detailed market analysis of hotel establishments in the area, assessed the convention and trade show potential, designed a survey of local businesses concerning their use of hotel, meeting and exhibition facilities, and participated in the negotiations with executives of major hotel chains in regards to possibly locating in the development site.

Department of Fisheries and Oceans: Recreation
Harbours Development Program, Maritime Provinces

Participated in a major economic study of recreational harbours, for the Small Craft Harbours Branch in the Maritimes Region. Mr Oren's assignments included preparation of an inventory of recreational harbour facilities through a survey of marinas, yacht clubs and government officials and analysis of the adequacy of the facilities and the need for additional facilities to accommodate current and future demand. Other tasks included projection of future growth in recreation harbours, review of development policies and strategies of the various Provincial Government agencies and examination of the need for Federal Government involvement in recreation harbour development and management.

Transport Canada: Impact of Air Transportation
on the Tourism Industry in the Toronto Region

Analysis of the importance of air travel and Toronto International Airport to Ontario's tourist industry. Mr. Oren's involvement included review of the socio-economic profile of air travellers to and from Toronto and comparison to that of travellers by other modes, examination of tourism related expenditure patterns of travellers to and from Ontario, and estimating the employment generated by travellers' expenditures within the Province.

URBAN/REGIONAL PLANNING

Regional Municipality of Haldimand-Norfolk, Ontario

Participated in the review of the Official Plans of the Towns of Port Dover, Simcoe and Caledonia. Tasks included analysis of existing land use patterns and impact of proposed developments on municipal servicing capacity, parks and recreation facilities, schools and transportation infrastructure. Short and long term Official Plan alternatives were evaluated and a policy framework was proposed to accommodate future growth, in consistence with the needs of the region and the general objectives of each particular urban centre.

Small Craft Harbour Branch: Ontario Fishing Harbours Study

A study to develop a five-year financial program for commercial fishing harbours in Ontario. Involvement included analysis of the demand for harbour facilities and improvements, inventory of harbour facilities and assessment of fishermen's willingness to contribute toward the maintenance of harbour facilities. Other tasks included survey of fishermen, computer analysis of survey results and assistance in the development of alternative policy options.

Ontario Ministry of Housing: Analysis of Housing Needs in Central Ontario

Participated in studies assessing housing needs by type, for the geographic area of Central Ontario Lakeshore Urban Complex (COLUC). Tasks included development of a forecasting methodology of the demographic housing demand, preparation of estimates of the demographic housing demand for the upcoming years and establishment of potential housing targets for the various regional municipalities in the area.

AVIATION STUDIES

Transport Canada: General Aviation Survey at Toronto International Airport

Participated in the planning of a survey to study the activities at the general aviation facilities at Toronto International Airport. Involvement included planning of the various parts of the survey including questionnaire design. Some 500 face-to-face interviews were carried out in addition to 250 mail-out questionnaires that were sent to general aviation users based at Toronto International Airport.

Transport Canada: Business Aviation Activities in the Toronto Region

Assessment of the long term economic impact of business aviation on the Toronto Region. Involvement included preparation of a socio-economic profile of the business aviation sector and analysis of various corporate practices which govern the operation of business-owned, rented or chartered aircraft.

Transport Canada: Toronto Island Airport Users Study

Coordinating a study to establish a profile of individuals and companies who use aircraft based at Toronto Island Airport. A survey of airport users was undertaken and the results were analyzed using an SPSS computer program. The study was part of Transport Canada background studies of "Alternative Aviation Uses of the Toronto Island Airport".

U.S. Department of Transportation: Airport Planning Lectures

Participated in the preparation of lecture program on airport planning for the Transportation System Center of the U.S. Department of Transportation. Involvement included the preparation of three lecture sessions in the program which covered the areas of Airport Systems, Airport Development and Passenger Terminal Facility.

TRANSPORTATION PLANNING

Urban Transportation Development Corporation: Intermediate Capacity Transit System

A study to assess the environmental impact and relative public acceptability of alternative elevated Intermediate Capacity Transit Systems (ICTS) in selected urban settings in Toronto, Ottawa and Hamilton. Tasks included review of the various environmental impacts and public acceptability of several elevated transit systems in the U.S.A., Britain and Canada; assistance in the development of quantitative and qualitative methods for environmental assessment in general and noise impact in particular; and participation in a survey of various urban street settings for which the potential environmental impacts were later measured.

Transportation Development Agency: Computerized Bus Passenger Information System

Design and development of the Easy Rider service in which Mississauga Transit cooperated with the Federal Government's Transportation Development Agency in the development of Automated Bus Passenger Information (ABPI) demonstration project. The system was designed to provide prospective transit passengers with precise, real time information concerning the estimated arrival time of buses at the stop closest to their homes or place of work, using automatic vehicle monitoring devices and computer voice messages received through the telephone. Assignments included consulting Mississauga Transit in the daily operation of the system, planning a variety of surveys including the carrying out and the statistical analysis of these surveys using SPSS computer programs, and coordinating the various marketing activities as part of the campaigns associated with the introduction of the Easy Rider service.

DAN Bus Cooperative, Tel-Aviv: Transit Communcations, Control and Information System

Participated in a study to design a bus monitoring, control and information system for the Tel-Aviv DAN Transit Company. Tasks included data collection in the field, analysis of service performance based on review of the operations and surveys of various components of the service and assessment of the existing management information both manual and automated.

City of Edmonton: Disabled Adult Transportation System

Assisted in the evaluation of existing and future market potential of the Disabled Adult Transportation System (DATS) in Edmonton. Other involvements included the design of a survey of potential users and data analysis.

SPACE/FACILITY PLANNING

Parkwood Hospital, London, Ontario

Participated in the evaluation of the existing hospital facilities and space use patterns, estimating the current and future space and facility requirements and providing preliminary alternative planning solutions to existing problems.

The T. Eaton Company, Toronto

Assisted in the space inventory and preliminary analysis of the various categories of existing space and company personnel. The work was part of the space planning project for the Eaton office tower, which is part of the Eaton Centre development in downtown Toronto.

Tel-Aviv University: Campus Master Planning

Assisted in data collection, review of existing campus space programs and standards in North America and preliminary analysis of the various indices and ratios used by the University in determining space requirements.

The Beer Sheva Home for the Aged

Coordinating a study to evaluate the physical design and existing programs at a senior citizens' home for new immigrants. The purpose of the study was to provide social and cultural/ethnic basis for architectural improvements at the Home. Involvement included preparation of detailed evaluation of the institution, accompanied by a set of recommendations for changes in the physical design and the existing programs.

ALAN VICTOR SEYMOUR

POSITION:

Associate - Beinhaker/Irwin Associates

MEMBERSHIPS:

Royal Architectural Institute of Canada
Ontario Association of Architects
Royal Institute of British Architects
Solar Energy Society of Canada

EDUCATION:

Dip. Arch. The Polytechnic, London, 1963.

AWARDS:

1977 - Commendation, R.I.B.A. Awards, Eldon Square Newcastle-Upon-Tyne.
1976 - Ontario Architects Association Design Award, Cumberland Court, Toronto.
1973 - Canadian Architect Yearbook Award, Hazelton Lanes, Toronto
1972 - Canadian Architect Yearbook Award, Cumberland Court, Toronto

AREAS OF SPECIALTY

Mr. Seymour specializes in the fields of Architecture, Urban Design and Facilities Development.

He has been involved in the design and execution of a wide range of buildings, including housing, commercial and institutional projects. He is also experienced in space planning, interior design and renovation work. He has a particular interest in energy conservation and has directed several projects involving the use of alternative sources of energy.

EXPERIENCE:

Prior to joining Beinhaker/Irwin Associates in October 1976, Mr. Seymour held positions with the following firms:

1975 - 1976
Hooper Hix Associates - Associate, 1976

1974 - 1975
Matsui, Baer, Vanstone

1967 - 1973
Webb, Zerafa, Menkes Housden Partnership

1970 - 1971
Chapman Taylor Partnership, England

1965 - 1967
Mathews, Ryan, Simpson, England

1963 - 1965
Pane Manousso Architect, England.

Alan Victor Seymour (Continued)

PROJECT EXPERIENCE:

1977 - present

Beinhaker/Irwin Associates

Ben Gurion Airport, Israel, 1980 - Preparation of alternative design concepts for new terminal facility as part of concept evaluation process.

Calgary Light Rail Transit, 1979

- Assistance with detail design and working drawings of vehicle storage and maintenance facility.

- Preparation of design recommendations for station architectural details.

Residential Solar Retrofit in Canada, 1979 - Survey and review of "State-of-the Art" in Canada leading to preliminary assessment of market potential for solar retrofitting in Canada.

Solar Technics and the Canadian Greenhouse, 1978 - Survey and review of the commercial greenhouse industry leading to a series of proposals and designs relating to energy conservation in new and existing greenhouses. For Agriculture Canada.

Builders' Guide to Energy Efficiency in New Housing, 1978 - A current assignment for the Housing and Urban Development Association of Canada and the Ontario Ministry of Energy, to prepare a comprehensive guide to provide builders with a wide range of planning, design, construction, costing and marketing techniques to improve energy efficiency in new housing.

Solar Energy Monitoring System, 1978 - A current assignment for the Ontario Ministry of Energy, to develop a system for monitoring the performance of solar energy space heating and hot water for systems.

Lebourgneuf, Quebec, 1977 - Site planning and design for part of a new community near Quebec City. Architecture design of demonstration project featuring 114 moderate cost units in low-rise forms.

Place de la Colline, Quebec City, 1977 - Design development and working drawings for multi-use project on downtown site opposite Le Grade Theatre. 110 apartment units, 75,000 sq. ft. offices, 50,000 sq. ft. retail space.

Solar Heating, An Estimate of Market Penetration, 1977 - Took part in study estimating penetration of solar space and heating systems up to year 2001.

Energy Conserving Model Home, 1977 - Development of design for a demonstration 3 bedroom detached house demonstrating passive and active energy conserving techniques.

Eco. House, Toronto, 1976-77 - Co-ordinator of volunteer architectural group working with Energy Probe to provide new office space for Probe activities. The project demonstrates energy conserving techniques applied to an old house in an urban setting

Alan Victor Seymour (continued)

PROJECT EXPERIENCE: (continued)

1975 - 1976

Hooper, Hix Associates

Senior Citizens Solar Home, Aylmer, Ontario, 1976 - Preparation of design, design development, working drawings and consultant co-ordination for the winning design in a competition sponsored by O.H.C. The project demonstrates the application of solar heating and domestic hot water heating to a standard two-storey O.H.C. senior citizens building of conventional construction.

Provident House, Aurora, Ontario, 1975 - Assistance with the preparation of the design proposal for Canada's first solar house with a system based upon annual heat collection and storage.

Renewable Energy Resources, Harbourfront, Toronto, 1975 - Feasibility study for Ministry of State for Urban Affairs proposing the recycling of an existing steel frame structure as a large scale Winter Garden and recreational environment.

Envirogetics Suntrap, Envirogetics Heatsaver, 1975 - Assistance with the design development, production drawings and construction of prototypes for a high conductivity solar collector and counterflow heat exchanger. Prototypes are installed in the Provident House (q.v.).

Envirogetics Arctic Sunbath, 1975 - Assistance with the design development and projection drawings for a reflective enclosure designed to extend the sunbathing season by concentrating the suns rays onto a central beach.

1974 - 1975

Matsui, Baer, Vanstone, Architects

Existing Building Study - St. Lawrence Project, Toronto, 1975 - Preparation of report for use by Planning Team on the St. Lawrence Market area project. The report catalogues all the existing buildings within the site area, lists a range of possibilities for re-use, suggests an evaluation matrix as a means of structuring discussion and illustrates a number of options.

Housing Subdivision, Burlington, Ontario, 1975 - Design studies for a series of traditional facade variations--Georgian, Tudor, Colonial, French Provincial, Rosedale--applied to four basic plan types. This work involved study of traditional materials and detailing and their interpretation under modern conditions. An attempt to break into the area of medium price range subdivision housing rarely covered by architects.

District Jail, Sudbury, Ontario, 1974 - Research on program requirements and preparation of design for new jail facilities for the Ministry of Correctional Services. Designed as a phased construction project around the existing jail, to house ultimately 160 inmates.

Alan Victor Seymour (continued)

PROJECT EXPERIENCE: (continued)

Senior Citizen Resident, Rexdale, Ontario, 1974 - Preparation of program and design for multi-use building with the following facilities:

- senior citizens residence containing 193 suites and associated social facilities
- senior citizens day-care facility
- childrens day-care facility
- office space for welfare organization
- presbyterian church
- church/community facility.

1970 - 1971

Chapman Taylor Partnership (England)

Eldon Square Central Area Redevelopment, Newcastle-Upon-Tyne, Commendation. R.I.B.A. Awards, 1977 - Design co-ordinator for exterior of city centre complex featuring enclosed shopping malls, recreation centre, bus concourse, market and parking.

1967 - 1973

Webb, Zerafa, Menkes, Housden Partnership

Hazelton Lanes, Toronto, Ontario, 1973 - Canadian Architect Yearbook Award, 1973. Preparation of design for multi-use infill development comprising two 5-storey apartment complexes above floor and 2 retail floors over basement parking. The design was submitted to local residents for approval before presentation to city, and later became one of the first schemes to pass the 45'.0"/40,000 sq. ft. holding by-law.

Cumberland Court, Toronto, Ontario, 1971-73 - Canadian Architect Yearbook Award, 1972. O.A.A. Design Award 1976. Preparation of design, detail design, office planning and design supervision of multi-use infill development comprising 2-storey studio office for WZMH, medical suites, restaurant, coffee shop, shops and parking.

Lothian Centre, 1970 - Preparation of design and master plan for office tower, retail space, cinema and parking. A series of pedestrian malls and courtyards provide links between Bloor Street and Yorkville, integrating with existing pedestrian routes and subway entrances.

Royal Centre, Vancouver, British Columbia, 1969 - Preparation of design for downtown complex including 600-room hotel, 27-storey office tower, medical suites, bank, retail space, 2 cinemas, and parking.

Toronto Star Building, Toronto, Ontario, 1969 - Preparation of design for 5-storey newspaper printing and production plant, editorial offices and 25-storey office tower. The design was judged the winning proposal out of four developer-proposal submissions on a design/cost basis. Responsible for detail design development after winning contract.

Alan Victor Seymour (continued)

PROJECT EXPERIENCE: (continued)

University of Waterloo, Ontario - Married Student Housing, 1969 - Preparation of design for 240 1-bedroom, 360 2-bedroom apartments, community centre and landscaping. the design was judged second out of 13 entries in a Development Proposal Call issued by the Ontario Student Housing Corporation.

Laurentian University, Sudbury, Ontario, 1968 - Housing for 250 students. Preparation of design for 11-storey hall of residence, common room and recreational facilities. This project was judged second out of six entries in a Development Proposal Call similar to that described for the Married Students Housing.

Canadian Medical Association Headquarters, Ottawa, Ontario, 1968 - Headquarters building containing conference rooms, reception areas, restaurant, library, archive and office space.

Greenford Plaza, Hamilton, Ontario for Steinbergs Limited, 1968 - Area 136,000 square feet. Preparation of design for department and food store linked by covered shopping mall.

University of Waterloo, Ontario, Housing for 960 students, 1967 - Preparation of design for four halls of residence, associated common rooms, recreational and dining facilities. Preparation of design, working drawings and specification for landscaping. The design was judged the winning proposal out of 12 entries in a Development Proposal Call, similar to that described for the Married Student Housing.

1965 - 1967

Mathews, Ryan, Simpson, England

Alterations to "The Clock" public House Hebburn, County Durham for Vaux Breweries, 1967 - Project architect for whole scheme consisting of modernization of existing premises. Responsible for establishing clients' brief, preparing sketch designs and cost estimate leading to final presentation for client approval. Preparing working drawings and obtaining statutory approvals. Writing specification and organizing tenders. Site visits and contract administration through to completion and checking of final accounts.

Private Housing Layouts for C.M. Yuill Ltd. in Yorkshire and County Durham, 1966 - Detail design and preparation of working drawings in conjunction with American liaison architect.

1963 - 1965

Paul Manousso, England

Shops and flats, Bristol, for Maybrook Properties Ltd., 1964 - Area 9,700 sq. ft. Job architect for whole scheme of six shops with six flats over. Responsible for establishing clients' brief, preparing sketch designs and cost estimate leading to final presentation for client approval. Preparing working drawings and obtaining statutory approvals. Organizing tenders. Site visits and contract administration through to completion and checking of final accounts.

ROBERT W. LOWRY

POSITION:

Partner - Ellis and Lowry Consultants Limited
Affiliate - IBI Group

MEMBERSHIPS:

Royal Architectural Institute of Canada
Ontario Association of Architects

EDUCATION:

Bachelor of Architecture, University of Toronto, 1971.

AREAS OF SPECIALTY:

Mr. Lowry through extensive personal experience, concentrates on the definition of requirements for buildings. In addition he is familiar with the traditional aspects of architectural practice and maintains his own graphic design firm.

EXPERIENCE:

1977 To Present
Partner, Ellis and Lowry Consultants Limited, Toronto

1975 - 1977
Director, Facility Programming and Systems Development,
Built Environment Co-ordinators Limited, Toronto

1974 - 1975
Personal Sabbatical Tour,
Europe, North Africa and Asia Minor.

1973 - 1974
Senior Architectural Designer,
Covell Matthews Partnership, London, England.

1972 - 1973
Architectural Draftsman,
Webb Zerafa Menkes Housden Partnership, Toronto.

1971 - 1972
Facility Programmer,
Built Environment Co-ordinators Limited, Toronto.

PROJECT EXPERIENCE:

The projects listed below indicate the range of involvement and consulting experience achieved by Mr. Lowry during the past few years.

Lakeland College, Vermilion, Alberta. 1979-80 - Ongoing consultation related to existing and future facilities: space utilization analysis to identify potential for increased use of existing facilities; building program requirements for new academic and support space; building program requirements for a major renovation of the existing dormitory and administration building; energy conservation study to identify potential physical and operational improvements.

Renovation Planning for 9th Floor, National Offices, United Church of Canada, 1980 - Preparation of program of requirements and schematic alternatives for General Council offices resulting in consolidation of previously dispersed parts; creation of more effective and functional meeting areas for entire organization; and ensured ease of access to executives. Report included cost estimates for preferred alternative.

Building Program Addendum, Federal Health Centre, Collins Bay, Ontario, 1979 - Preparation of a report to reflect changes in original building program and restraints imposed by a reduced construction budget. Achieved a 15% reduction in net area which should be sufficient to allow building to be constructed within budget.

Government Ministries Buildings, Dodoma, Tanzania, 1978 - Development of Architectural Design Brief for the first five government ministries to move from Dar es Salaam to the new capital, Dodoma. Provision also of facility requirements for use by design team in planning for the remaining government functions and several other institutional components of the central city area.

Building Program Guidelines, The Correctional Service of Canada, 1979 - Development of criteria for establishing facility requirements for industrial components associated with federal penitentiaries. Typical conditions, critical requirements and planning considerations were identified. Also, performance specifications were developed for pre-engineered structures for use in correctional settings.

Ongwanada Hospital, Kingston, Ontario, 1978-79 - Development of a role for Ongwanada as a regional resource centre for the mentally retarded in southeastern Ontario including definition and organization of specific programs, on both a regional and local basis. Identification of accommodation options for both developmental and health care functions of the hospital.

Regional Psychiatric Centre, Kingston, Ontario, 1977 - Identification and documentation of complete operational and facility requirements for new 170 bed hospital for Canadian Penitentiary Service. Responsibilities for project conception, co-ordination, development and production.

PROJECT EXPERIENCE: (Continued)

University of Calabar, Calabar, Nigeria, 1977 - From student enrolment projections the facility requirements complete with necessary phasing, were developed for use during the initial master planning.

Canadian Penitentiary Service, 1977 - Senior facility programmer during the identification and documentation of complete operational and facility requirements for a new Regional Psychiatric Centre, two new Medium Security Institutions and other similar projects.

King Abdulaziz University, Jeddah, Saudi Arabia, 1976-77 - Development of facility requirements for science and engineering facilities. Subsequent analysis of complete facility requirements related to enrolment growth projections using computer generated models.

Design Control Studies, England, 1974 - Identification of potential site planning and cosmetic design modifications for typical single family suburban housing unit types to improve market acceptability.

Schematic Design Studies, England, 1973-74 - Various infill and redevelopment schemes throughout London and south-east England to determine development potential and official reaction from local authorities.

Government Assisted Housing, England, 1973-74 - Initial schematic, design development and final drawings for multiple unit housing estates within controlled space and budget guidelines.

Feasibility Study for a Centre for the Elderly, Toronto, 1972 - Background research in specific characteristics and requirements of the aging as a group and within the project area.

MICHAEL H. ELLIS

POSITION:

Partner - Ellis and Lowry Consultants Limited
Affiliate - IBI Group

EDUCATION:

Bachelor of Arts, Trent University, 1971.

MEMBERSHIP:

Royal Architectural Institute of Canada (Affiliate)

AREAS OF SPECIALTY:

Mr. Ellis has extensive planning experience focussing on the definition and analysis of facility requirements, and including policy planning, development of objectives, predesign planning and feasibility studies.

EXPERIENCE:

1977 to Present
Partner, Ellis and Lowry Consultants Limited, Toronto.

1975 - 1977
Co-ordinator, Facility Programming,
Built Environment Co-ordinators Ltd., Toronto.

1972 - 1975
Facility Programmer, Policy Planning Co-ordinator,
K.L. McReynolds Ltd., Thornhill.

PROJECT EXPERIENCE:

The projects listed below indicate the range of involvement and consulting experience achieved by Mr. Ellis.

Renovation Planning for 9th Floor, National Offices, United Church of Canada, 1980 - Preparation of program of requirements and schematic alternatives for General Council offices resulting in consolidation of previously dispersed parts; creation of more effective and functional meeting areas for entire organization; and ensured ease of access to executives. Report included cost estimates for preferred alternative.

Building Program Addendum, Federal Health Centre, Collins Bay, Ontario, 1979 - Preparation of a report to reflect changes in original building program and restraints imposed by a reduced construction budget. Achieved a 15% reduction in net area which should be sufficient to allow building to be constructed within budget.

Program Services for Elderly Persons with Dementia, Kingston, 1979 - Assistance to community-wide group in preparation of a letter of intent to government describing a comprehensive set of services for elderly persons exhibiting progressive intellectual deterioration.

Michael H. Ellis (Continued)

PROJECT EXPERIENCE: (Continued)

Charlottetown Corrections Centre, Prince Edward Island, 1974 - Preparation of building program for facility to accommodate 75 male and female juveniles and adults.

Regional Detention Centres, Ontario, 1972-73 - Preparation of building programs for provincial detention centres in Toronto, London and Hamilton.

Baffin Region Corrections Program, Northwest Territories, 1973 - Development of plan to meet needs of correctional system in Baffin Island Region recommending development of community based programs and services in lieu of central facility component in recognition of the unique needs of the Inuit.

Northern Manitoba Corrections Program, 1973 - Preparation of a plan for corrections programs in remote areas of northern Manitoba incorporating needs of native peoples and others in community and facility based programs of services.

Regional Psychiatric Centre, Kingston, Ontario, 1977 - Identification and documentation of complete operational and facility requirements for new 170 bed hospital for Canadian Penitentiary Service. Responsibilities for project conception, co-ordination, development and production.

Corrections System Planning:

- Adult and Juvenile Systems, Jamaica, 1974-75
- Adults and Juveniles, Prince Edward Island, 1974
- Adults, Northern Manitoba, 1973
- Adults, Baffin Region, Northwest Territories, 1973
- Correctional Treatment Programs, Jamaica, 1975

Determination of correctional system development policy with specific reference to physical accommodation requirements.

Facility Programs - Canadian Penitentiary Service - Medium Security Institutions, Dorchester, New Brunswick and Kamloops, British Columbia; and Maximum Security Institution, Agassiz, British Columbia;

Department of Correctional Services, Jamaica - Adult Remand Centre, Kingston; and High Control Institution, Kingston, Jamaica, 1974-5.

Department of Corrections, Prince Edward Island - Charlottetown Correctional Centre, 1974.

Ministry of Correctional Services, Ontario - Regional Detention Centres, London, Toronto, Hamilton, 1972-3.

Senior programming and advisory responsibilities for the identification and documentation of complete operational and facility requirements. Liaison with architect during design development.

Michael H. Ellis (Continued)

PROJECT EXPERIENCE: (Continued)

Building Program Guidelines, Industries Division, Canadian Corrections Services, 1978-79 - Develop criteria for establishing building requirements for industrial programs for correctional institutions. Identify typical conditions, critical requirements and planning considerations for use in planning for future facilities when product type, production volume and work force are established. Also develop performance specifications for pre-engineered structures for use in correctional settings.

Ongwanada Hospital, Kingston: Developmental Care, 1978-79 - First part dealt with development of a role for Ongwanada as a regional resource for the mentally retarded in southeastern Ontario. Development of concept, organization and implementation strategy. Second part dealt with service role to mentally retarded in Kingston area. Third part examined accommodation options to meet needs of various developmental care and health care programs.

Ongwanada Hospital, Kingston: Health Care, 1978-79 - Preparation of role study to determine future involvement in health care and related service areas. Examine operation of existing 50 bed chronic care hospital; examine community health care system to establish required service needs; identify other related service areas whcih could be developed by the Board.

Central Concourse, Windsor, Ontario, 1976 - Preparation of operational and facility requirements through interview and survey for development project undertaken by Central United Church to accommodate church-centred programs, social and community services, and programs for the elderly.

Adult and Juvenile Corrections Master Plans, Jamaica, 1974-75 - Preparation of plans to restructure corrections system for Jamaica including identification of program requirements and facility and community components.

Adult Remand Centre, Kingston, Jamaica, 1974 - Building program for 100-bed remand centre and liaison with design architect.

High Control Correctional Centre, Jamaica, 1975 - Preparation of architectural building program for maximum control institution.

Reception and Diagnostic Centre, Kingston, Jamaica, 1975 - Development of program descriptions and preparation of building program.

Correctional Treatment Programs, Jamaica, 1975 - In collaboration with a corrections program consultant, development of program descriptions including nature of program, resource availability, staffing and costs.

Medium/Maximum Security Institutions, Canada, 1976-77 - Preparation of building programs including operational statements for federal institutions in New Brunswick and British Columbia.

Correctional System Requirements, Prince Edward Island, 1974 - Development of policies and plan for adult and juvenile corrections system utilizing community-based and institutional components.

ALISTAIR WILLIAM BAILLIE

POSITION:

Associate - IBI Group

MEMBERSHIPS:

Association of Professional Engineers of the Province of Ontario
Institution of Civil Engineers, U.K. (Associate).

EDUCATION:

B.A.Sc., (Civil Engineering), University of Waterloo, 1971.

AREAS OF SPECIALTY:

Mr. Baillie specializes in the transportation field including urban/regional transportation, urban transit studies, transportation operations, communications, control and parking. His experience includes projects in related fields such as urban/regional development, environmental impact and management and official plans/bylaws.

EXPERIENCE:

Prior to the founding of IBI, Mr. Baillie held positions with the following organizations:

1973 - 1974
Consultant, Peat, Marwick and Partners.

1971 - 1973
Transportation Planner, Ontario Ministry of Transportation and Communications.

1966 - 1971
Under the co-op system at the University of Waterloo, held positions with the transportation group at the University of Waterloo, Ontario Hydro and James F. MacLaren Limited.

Alistair William Baillie (Continued)

PROJECT EXPERIENCE: (Continued)

City of Hamilton, 1975 - Responsible for estimating travel demands for the Rapid Transit Development Program for the City of Hamilton. The study involved identifying a basic trunk transit network and priority corridor for implementation and preparing broad performance specifications. The road and transit volumes associated with the various land use concepts and networks were generated using the IBIMOD transportation model.

City of Halifax, 1975-76 - Conducted the analysis for the Downtown Transportation Study for the City of Halifax. This study involved formulating recommendations regarding traffic and transit access in Downtown Halifax in light of proposed development plans.

1973 - 1974

Peat, Marwick and Partners

The Parking Authority of Toronto, 1974 - Conducted the study to determine the need for a parking garage in the mid-town core of the City of Toronto. Study included examining the effect of development on public and private parking in light of the present and future policy trends.

Central Ontario Lakeshore Urban Complex Task Force (COLUC), 1974 - Participated in the application of the EMPIRIC Growth Allocation Model as part of the structured plan to enable guidance to provincial and regional policies and programs within the urban complex stretching from Hamilton to Oshawa.

City of Burlington, 1974 - Managed the implementation of dial-a-bus service in the City of Burlington. This involved developing operating and dispatching procedures, design of necessary documentation and briefing all staff assocaited with the dial-a-bus system.

City of Mississauga, 1974 - Participated in a study to determine the traffic impact of proposed development in the North-North Dixie Area. Study involved collection and analysis of existing traffic conditions and the estimation of future traffic with recommendations on staging and construction of the arterial roads.

City of St. Catharines, 1973-74 - Conducted the study of operations for the public transit system in the City of St. Catharines. Study appraised the existing system, generated alternatives for fixed route and demand-responsive services and made recommendations regarding fleet maintenance and systems management.

Metropolitan Area Planning Commission, 1974 - Participated in a feasibility study for a Traffic Management Centre for the City of Halifax. The study involved developing a set of transportation policies, operating procedures and control devices which would allow agencies to control activities more effectively and increase the carrying capacity of the existing transportation system.

Urban Transportation Development Corporation, 1974 - Conducted a study to determine the primary and secondary market potential for a small bus including its various options and configurations.

Alistair William Baillie (Continued)

PROJECT EXPERIENCE:

1974 - Present

IBI Group

SOMATS (Southern Ontario/Montreal Air Transportation Study), 1978-79 - Mr. Baillie has been involved in this project over the last two year period. He assisted in the development of the work program. He was responsible for the rationalization of the SOMPS and SOMATS study strategies. He was also responsible for the development of the evaluation criteria and the evaluation technique used to evaluate the eight alternative strategies. In addition, Mr. Baillie has been heavily involved in the evaluation of the ground access systems associated with the supply strategies. At present Mr. Baillie is providing guidance to Transport Canada in assessing the impact of congestion on the regional road system or passenger contingency allowance for en route delays in travelling to the Pickering and Malton airports and assessing the impact on the terminal facilities.

SOMATS (Southern Ontario/Montreal Air Transportation Study), 1978 - Involved in the evaluation of the ground access systems associated with the terminal facilities for each of the alternative supply strategies developed for the Southern Ontario/Montreal Air Transportation Study. The evaluation included examining each ground access system in accordance with criteria such as availability, capability, costs, etc.

SOMPS (Southern Ontario Multi-Modal Passenger Study) - Involved in assessing the impact of congestion on the regional road system on passenger contingency allowances for en route delays in travelling to and from Malton Airport and assessing the impact on terminal facilities.

City of Mississauga, 1978-79 - Presently managing a feasibility study for para-transit in the City of Mississauga. The study involves an evaluation of the Mississagua Transit routes together with an assessment of the possible para-transit options. The output from the study is anticipated to be a series of recommendations for implementing one or more para-transit experiments in Mississauga.

Regional Municipality of Hamilton-Wentworth, 1978-79 - Conducted the travel demand feasibility analyses for the Mountain East-West and North-South Corridor Study.

City of Winnipeg, 1978 - Managed a study to develop a set of measurement characteristics and an evaluation procedure to be used in assessing the performance of the future land use/transportation system options being considered in the review of the Greater Winnipeg Development Plan.

City of Toronto Planning Board, 1978 - Managed a study to evaluate the adequacy of the existing and future supply of non-residential parking in the Yonge/St. Clair area. The results of the study are to provide a basis for the parking policies contained in the Yonge/St. Clair Part II Official Plan.

Alistair William Baillie (Continued)

PROJECT EXPERIENCE: (Continued)

City of Toronto Housing Department, 1978 - Managed a study to assess the adequacy of the proposed parking supply for a 835 residential development.

Baycrest Centre, 1978 - Managed a study of the parking requirements and the access/egress facilities to the Baycrest Centre in North Park.

City of Calgary, 1978 - Conducted a study of the parking requirements for the Light Rapid Transit System. The study involved assessing the parking requirements for both employees and residents in the corridor and the potential for shared-use parking.

City of Toronto, 1974-77 - Managed a study to determine the parking and loading requirements related to various land uses in the Central Area of the City of Toronto. The study involved a survey of over 200 buildings, 250 companies, 40,000 employees and 20,000 visitors within the Central Area of the City. It is anticipated that the results of the study will be incorporated into a new zoning by-law.

Borough of York, 1977 - Managed a study which examined the transportation and land use impacts of the proposed Eglinton Rapid Transit Line in the Borough of York.

Town of Newcastle, 1977 - Managed a study which examined the transportation impact of the proposed residential Courtice Heights Development in the Town of Newcastle.

McLaughlin Square, 1977 - Managed a study which examined the transportation impact of the proposed McLaughlin Square mixed use development in the City of Oshawa.

Public Works Canada, 1977 - Participated in a study to determine parking policies in Canadian cities with populations of 25,000 to 75,000 for the Urban Design Branch of Public Works Canada.

Town of Thornbury, 1977 - Managed a study to determine the transportation impacts of a proposed recreational development in the Town of Thornbury.

City of Windsor, 1977 - Participated in a study which evaluated the City of Windsor transit system and made recommendations on system improvements.

National Capital Commission, 1976 - Responsibile for estimating travel demands for the Ottawa-Hull Interprovincial Corridor Study. The study involved determining future road and transit volumes relative to different land use concepts and rapid transit systems. These volumes were determined through application of the new Simplified Computer Package (System 033) which has recently been developed by the Ministry of Transportation and Communications.

DAN CALMUSKY

POSITION:

Planner - IBI Group

EDUCATION:

Bachelor of Arts (Honours), Brock University, 1973.

AREAS OF SPECIALTY:

Mr. Calmusky specializes in the field of Urban and Regional Planning. His experience includes projects related to development of new subdivisions; programs for redevelopment and rehabilitation; housing policy; and amendment to official plans and zoning by-laws.

EXPERIENCE:

1979 - Present
Planner, IBI Group

1976 - 1979
Development Planner, City of Welland, Welland, Ontario

1975 - 1976
Neighbourhood Improvement Program Coodinator, City of Welland, Welland, Ontario

PROJECT EXPERIENCE:

1979 - Present

On behalf of several private sector clients Mr. Calmusky is responsible for the planning of subdivisions located in Oakville and Mississauga. This involves extensive contact with municipal planners and other public sector representatives regarding financial and planning implications of alternate planning concepts.

1976 - 1979

In his capacity as Development Planner for the City of Welland, Mr. Calmusky was responsible for the formulation of the municipality's response with regard to applications for subdivision, official plan amendment and rezoning. His involvement included the preparation of development control and subdivision agreements. Specifically, his participation in the review of the impost fee structure for the City of Welland, provides direct experience concerning the financial implications of growth.

1975 - 1976

Mr. Calmusky's involvement with N.I.P., R.R.A.P., and O.H.R.P. included the preaparation of a redevelopment plan for an established area of the municipality as well as extensive experience with the public participation process through the administration of the respective programs.



CRAIG M. MILLER

POSITION:

Consultant - IBI Group

MEMBERSHIPS:

Sigma Xi, The Scientific Research Society.

EDUCATION:

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Received the degree of Master of Science in Technology and Policy, June,1979. Thesis evaluated the use of economic incentives as alternatives to regulation in the control of aircraft noise. Course work included microeconomics, systems analysis, and project evaluation. Awarded Parks Canada Scholarship, July 1978; M.I.T./Sloan Fellowship, September 1977.

QUEEN'S UNIVERSITY

Received Bachelor of Science degree in Civil Engineering, May 1975. Queen's University Engineering Society Award, May 1975.

AREAS OF SPECIALTY:

Project evaluation; policy analysis; environmental assessment.

PROJECT EXPERIENCE:

1979 - Present

IBI Group, Toronto, Ontario

Project experience includes the following:

Urban Fringe Parking Study - This study for the Ministry of Transportation and Communications is analyzing the need for fringe parking areas to accommodate carpools. Over 150 sites in Southern Ontario have been evaluated and a list of recommended sites is being prepared.

Traffic Management Energy Impacts Study - This study, also for MTC, is evaluating traffic management strategies with respect to their potential for saving energy. The final report will recommend specific strategies for adoption in Ontario.

Small Craft Harbours - Major responsibility on this project was the analysis of benefits of maintenance and capital improvements at commercial fishing harbours in the Maritimes. This study analyzed current capital and operations and maintenance expenditures and identified deficiencies in relation to existing harbour requirements and industry needs. A five year program for harbour development was proposed. The benefit analysis was based on the results of a survey of fishermen and data on fishing operations from several other services.

Craig M. Miller (Continued)

PROJECT EXPERIENCE: (continued)

Finanaicl Analysis - Responsibile for financial analysis of commercial development projects, including an office complex and a resort hotel.

Market Analysis - Carried out analyses of the housing market in London, Ontario, and the market for a microprocessor-based traffic control device. These studies involved a large amount of data collection through telephone interviews and field visits. A further project involved analyzing the demand for new commercial space in a large Ontario municipality.

1975 - 1977

James F. MacLaren Limited, Toronto, Ontario
Environmental Consultants

Project Engineer in the Environmental Quality Group. Coordinator of several studies (with responsibilities for technical content, budget control and report preparation), including:

- environmental impact assessment of a coal-fired electrical generating station
- a study of environmental monitoring systems in Canada
- a study on the implementation of policies relating to noise control in the City of Mississauga.

Involved as a project engineer on other studies, including: environmental impact assessments of uranium mining and milling activities, and electrical generating stations; and studies of solid wastes in the organic and inorganic chemical industries in Ontario.

Summer 1974

Amoco Canada Petroleum Company Limited, Calgary, Alberta

Summer project was an evaluation of the 'AIMS I' geophysical computer model.

1973

St. Lawrence College, Kingston, Ontario

Field supervisor of a sediment and water quality sampling program in Kingston Harbour and the Cataraqui River.

1972

Queen's University, Kingston, Ontario

Member of the Urban Vehicle Design Team. The team constructed an automobile which was entered in the Urban Vehicle Design Competition held at the GM Proving Grounds, Milford, Michigan.

1971

James F. MacLaren Limited, Toronto, Ontario

Worked on a sociological survey for the City of Toronto Noise Control Study.

Craig M. Miller (Continued)

PUBLICATIONS

'Airport Development in the '70's: A Case Study of Cleveland Hopkins International Airport', distributed by the Intercollegiate Case Clearinghouse Public Policy and Management Program at Harvard University.

'Assessing the Environmental Impacts of Resource Recovery Facilities' (with M. Bever), forthcoming in Environmental Impact Assessment Review, Plenum Publishing, New York.

'Solid Waste Characterization of the Organic Chemical Industry in Ontario' (co-author), presented to the 26th Canadian Chemical Engineering Conference, October 1976.

CALVIN BEACH

POSITION:

Senior Design Engineer, IBI Group

EDUCATION:

Suffolk College, England - HNC Certificate in Civil Engineering and ONC Certificate in Mechanical Engineering.

MEMBERSHIPS:

Association of Professional Engineers, Ontario
Member of the Institite of Civil Engineers
Member of the Institute of Municipal Engineers

AREAS OF SPECIALTY:

Municipal Engineering: 10 years of design and site supervision experience with Public Authorities in England in traffic engineering, geometric design of roads, design of storm and sanitary systems, relocation of services. Pre-engineering and feasibility studies in Calgary, Edmonton and Toronto.

Civil Engineering: 8 years design and site supervision experience in the design of bridges, retaining walls, subways, culverts, load assessment of bridges, remedial work to bridges, piled foundations, under pinning works, structural calculation checks on building structures, computer usage, planning and scheduling of works and network analysis.

EXPERIENCE:

IBI Group, Calgary

Project Manager of the IBI team engaged on the City of Calgary Light Rail Transit Project. High level liaison with the City Manager and his staff. Liaison and design co-ordination with other city departments and consultants. In charge of civil and municipal works other than railway and bridges. Prepared contract documents and in charge of site supervision of works. Design concept re: layout and servicing of subdivisions for Carma and Melchor Developers, in Calgary. Design concept, pre-engineering and cost estimates for Carma Developers in the Town of Leduc. Design concept and pre-engineering for Frost Homes Developers in the Town of Cold Lake. Feasibility engineering studies for Carma Developers and Shell Canada in the Towns of Burlington and Mississauga.

West Yorkshire Metropolitan County Council

Team leader on several structural projects from concept to preparation of contract documents and site supervision. Bridge loading assessments and maintenance, structural design calculations.

Calvin Beach (Continued)

EXPERIENCE: (Continued)

City of Leeds

Roads and General: Senior assistant engineer on team that designed Inner Ring Road Motorway. Designed several grade separated intersections. Developed construction sequence drawings, network analysis, prepared contract documents.

Appointed assistant resident engineer, supervised and managed contract.

Structures: designed reinforced and prestressed concrete bridge decks. Abutment, subway and retaining walls. Extensive computer usage.

East Suffolk County Council

Trunk roads: Articled to the East Suffolk County Surveyor. Trained in draftsmanship, surveying, geometric design of roads, storm and sanitary systems, preparation of contract documents. Designed the Wangford and Haughley New Street By-passes.

NOMI GOODMAN

POSITION:

Consultant - IBI Group

EDUCATION:

B.A. in statistics, 1977, Hebrew University of Jerusalem. Statistics courses included seminar in time series analysis, mathematical probability, statistical theory, regression and operations research. In addition computer programming, data processing, mathematics and economics courses.

AREAS OF SPECIALTY:

Statistical analysis.

EXPERIENCE:

Residential Development - Market Study and Financial Analysis (1979-80) - On behalf of a private developer in Mississauga, assisted in a market study to determine future demand for housing in Mississauga, particularly as it relates to the developer's land. In addition, Ms. Goodman was involved in cost and income analyses for the second phase of the development.

Town of Vaughan - Housing Study (1979-80) - As sub-consultants to a consulting team working for the Town, assisted in preparation of estimates of future demand for housing in the Town, to determine the adequacy of present designations of residential land.

Residential Development - Financial Impact (1979) - On behalf of a major oil company, analyzed the financial impact on the Region of Peel and on the City of Mississauga of a proposed residential development in that city.

Residential Development - Market Study (1979) - On behalf of a major oil company, assisted in the preparation of a housing market study with the Town of Burlington. Future demand was estimated and compared with existing and expected supply to ascertain the development potential.

Special Commercial Development - Market Assessment (1979) Estimated the future demand for special commercial development in Courtice, based on comparisons with other similar communities.

Shopping Centre Development - Market Assessment (1979) On behalf of the Town of Newcastle, Ms. Goodman assisted in the analysis of future demand for shopping facilities to serve the ultimate population allocated to the Town of Newcastle by the Durham Regional Official Plan.

Residential Housing - Market and Financial Viability Analysis (1978) - On behalf of a Toronto-based multi-function developer, Ms Goodman assisted in the design and analysis of a marketing study in order to establish the demand for and possible location of reitrement housing for the Dutch Community in South Central Ontario.

Nomi Goodman (Continued)

EXPERIENCE: (Continued)

Community Care Services Inc. (1979) - Designed evaluation methodology for a pilot project which makes use of students to assist senior citizens and the handicapped. Ms. Goodman conducted some of the interviews with people involved in the project, analyzed questionnaires, and made recommendations for the future of the project.

Transportation Development Agency/Mississauga Transit (1978) - Involved in an experimental system of automated bus passenger information designed to provide prospective transit passengers with precise information concerning the estimated arrival time of buses at the stop closest to their homes or place of work. Ms. Goodman's major constibution to this project is in analyzing the statistical implications of the introduction of the service on ridership and attitudes of the transit-riding population, making use of special surveys and ridership figures.

Polar Gas Project (1977-1978) - Participated in a socio-economic baseline study of Northwestern Ontario particularly in collecting and organizing data.

Town of Wasaga Beach (1978) - Prepared a cohort survival model for the population of the Town of Wasaga Beach.

Ongwanada Hospital (1978) - Participated in the collection and organization of information for a study of the mentally retarded population of Eastern Ontario. The study entailed estimating both the incidence and prevalence of mental retardation for 7 districts in Ontario, and preparing statistically reliable estimates of the likely number of mentally retarded for each of the districts for the year 1986.

Born:	Dundee, Scotland, 1938.
Current position:	Partner, Hanscomb Roy Associates, Canada
Professional qualifications and memberships:	Fellow, The Royal Institution of Chartered Surveyors Fellow, The Institute of Building Member, The Canadian Institute of Quantity Surveyors
Professional experience:	Before emigrating to Canada, Mr. Myles held senior positions with Chartered Quantity Surveyors in Scotland, engaged primarily in hospital projects. Prior to joining Hanscomb Roy Associates in 1972, Mr. Myles was senior estimator for a major Canadian general contractor, engaged in project management, tendering processes and post contract financial management. As a Partner at Hanscomb Roy Associates, Mr. Myles assists in the management of the Toronto office and shares responsibility for the production and quality control of the professional services. Within the practice, Mr. Myles has controlled or participated in the professional services on the projects listed herewith.
Academic positions:	Ryerson Polytechnical Institute Part-time lecturer in Building Economics, final year of Project Management Course.
Publication and Papers:	Manual for Cost Planning and Cost Control of Building Projects. (Stipulated Sum and Construction Management forms of contract) - Ministry of Transport.

PROJECT EXPERIENCE — ROBERT T. MYLES

HOSPITALS:	Health Science Building, Ottawa ($25M) Royal Ottawa Regional Rehabilitation Centre ($8M) Ninewells Teaching Hospital, Dundee, Scotland($50M)
OFFICES:	Government of Canada Building, Ottawa ($50M) Royal Insurance Building, Toronto ($8M) Safeco Insurance Building, Toronto ($2M)
AIRPORTS:	Mirabel International Airport, Montreal ($65M) Malton International Airport, Toronto ($200M) Djakarta International Airport, Indonesia ($300M) Orlando International Jetport, Florida ($30M) Kathmandu International Airport, Nepal ($15M) Ontario Airports at: - Windsor, Hamilton, London, Toronto Centre Island. Caribbean Airports at: - Jamaica, St. Kitts, Grenada, Dominica, St. Vincent.
INSTITUTIONAL:	National Art Gallery, Ottawa ($82M)
RECREATION:	Coburg Arena, Ontario ($2.5M) Recreation and Cultural Centre, Omaha, Nebraska ($79M)
COLLEGES:	York University, Administrative Studies Building ($6M)
SCHOOLS:	Brampton Vocational School ($5M) Fallingdale Public School, Bramalea ($1M) Hanover Public School, Bramalea ($1M) Longboat Public School, Scarborough ($2M)
INDUSTRIAL:	Canada Packers - Various
SPECIAL PROJECTS:	Metro Toronto Zoo ($25M) Vaughan Theme Park, Maple, Ontario ($105M)
STUDIES:	Yonge/Sheppard Complex - Feasibility Studies Multi-model passenger studies - Ministry of Transport Rental Rate Assessment Study (Toronto Industrial Airport) Project Control System Study (Ministry of Transport)

Born:	London, England, 1942.
Current Position:	Senior Quantity Surveyor/Cost Consultant Architectural Structural Division Hanscomb Roy Associates, Canada.
Professional Qualifications:	Undertook courses in Business Administration Construction Technology and Law at The Polytechnic, Regent Street, London, and at University of Natal, South Africa.
Professional Experience:	Entered the quantity surveying profession in 1958 and spent 10 years in professional offices in England until 1968, when he went to South Africa to join a multi-disciplinary practice. The next five years were spent in providing quantity surveying services comprising: budget estimating, cost control and bills of quantities on several varied projects throughout South Africa. He returned to England in 1973 and was in practice on his own account prior to joining Hanscomb Roy Associates in 1974. Since joining HRA, Mr. Gray's responsibilities have included general production coordination of the Toronto office. Within the practice Mr. Gray has controlled or participated in the professional services on many projects, some of which are included in the project experience list below.
Academic Positions:	Ryerson Polytechnical Institute, Architectural Department - Part time lecturer, Building Economics.
Project Experience:	
- Health	St. Michael's Hospital ($30 M) General & Marine Hospital, Owen Sound ($46 M) NorthYork Branson Hospital ($5M) West Park Hospital ($14 M) Toronto East General Hospital ($16 M)

/2.....

Project Experience (cont'd)

- Health (Special Services)	Furniture and Equipment Inventories - St. Michael's Hospital - West Park Hospital - Toronto East General Hospital
- Administrative	Bank of Nova Scotia Building ($6 M) Royal Insurance Building ($8 M) Whitby Hourthouse ($12 M)
- Special Projects	Port Complex, Jeddah, Saudi Arabia ($130 M) Calabar University ($1,100 M)
- Studies	Interstitial Space Study Sensitive Infill Study Ice Arena Study

PETER MASON

Born:	England, 1943
Current Position:	Associate, Hanscomb Roy Associates, Canada Senior Cost Consultant - Mechanical Division
Professional qualifications and memberships:	H.N.C., Mechanical Engineering Member, Institute of Heating and Ventilating Engineers Member, Institute of Refrigeration
Professional experience:	Upon completion of his formal education in 1959, Mr. Mason was an articled pupil in the Architect's Department of Durham County Council Heating Division for a period of 6 years. In 1965, joined the firm of Andrews Wetherfoil Ltd., District Heating Division, where he was responsible for the design/installation of district heating contracts throughout the U.K. In 1972, he became the General Manager of the mechanical and air conditioning department for Drake & Scull (Nigeria) Ltd., Nigeria. Services carried out included steam, condensate, water services, sewage treatment, large central air conditioning both air cooled and water cooled, and direct expansion. Mr. Mason joined HRA early in 1976, became an Associate of the practice in 1979 and is currently responsible for all mechanical cost control, budgeting and life cycle costing on a wide range of projects on which HRA is providing services in Ontario, Manitoba, Saskatchewan and Alberta. Some recent projects include - Seven Oaks General Hospital, Winnipeg Malton International Airport, Ontario London Regional Art Gallery Regina & Pasqua Hospitals, Saskatchewan Federal Government Interstitial Space Study National Gallery, Ottawa Queen Elizabeth Hospital, P.E.I. Concert/Theatre, Kitchener, Ontario Stage One Theatre, Stratford, Ontario Theatre Complex, York University. Athletic Complex, University of Toronto

Born:	Leamington Spa, U.K. 1942
Current Position:	Senior Consultant, Electrical Division
Professional Qualifications and Memberships:	Graduate of Danforth Technical School in Architecture and Building Construction Course
Professional Experience:	In 1959 joined the consulting firm of H.H. Angus & Associates Ltd. as electrical draughtsman and gained experience in the design development of electrical aspects of major commercial, institutional and health care projects in the Toronto area. Prior to joining Hanscomb Roy Associates in 1974, Mr. Wright was an electrical designer in the consulting firm of J. Chisvin & Associates Ltd., holding the position of Job Captain for several significant projects. Mr. Wright is currently responsible for all electrical cost control and budgeting on a wide range of projects on which Hanscomb Roy Associates is providing services in Ontario, Manitoba, Saskatchewan and Alberta.

Seven Oaks General Hospital, Winnipeg

Malton International Airport, Ontario

London Regional Art Gallery

Regina & Pasqua Hospitals, Saskatchewan

Federal Government Interstitial Space Study

National Gallery, Ottawa

Queen Elizabeth Hospital, P.E.I.

Concert/Theatre, Kitchener, Ontario

Stage One Theatre, Stratford, Ontario

Theatre Complex, York University.

Athletic Complex, University of Toronto

Athletic Complex, Trent University

Commonwealth Games Stadium, Edmonton, Alberta

APPENDIX "B"

COMPANY BROCHURE

IBI Group

The IBI Group is a partnership of companies providing professional services from offices in major cities in Canada and the United States. The group draws its strength from a team of over 100 professionals, many of whom have practised together for some 20 years. The disciplines represented include engineers, architects, planners, economists, computer scientists, systems analysts, and project managers.

A major strength of the group lies in its combination of analysts, who develop a detailed understanding of present systems, and synthesists, who build up creative, innovative solutions to problems.

The fields in which it practises are associated with the physical environment:

- transportation
- urban and regional planning and development
- architecture and facilities design
- economics and management sciences and services.

ALBERTA
5th Floor
205 - 9th Avenue S.E.
Calgary T2G 0R3 (403) 264-9740

Suite 404
10009 - 108 Street
Edmonton T5J 3C5 (403) 420-0101

BRITISH COLUMBIA
3rd Floor
1132 Hamilton Street
Vancouver V6B 2S2 (604) 689-3891

CALIFORNIA
359 San Miquel Drive
Suite 200
Newport Beach, California 92660
(714) 644-4091

MANITOBA
#1400
191 Lombard Avenue
Winnipeg R3B 0X1 (204) 943-4387

NOVA SCOTIA
Suite 512
6080 Young Street
Halifax B3K 5L2 (902) 453-4117

ONTARIO
100 Collier Street
Barrie L4M 4T4 (705) 737-2611

6th Floor
156 Front Street West
Toronto M5J 2L6 (416) 596-1930

QUEBEC
Suite 930, 1550 Boul. de
Maisonneuve West
Montreal (514) 935-1182

SASKATCHEWAN
2400 College Avenue
Regina S4P 1C8 (306) 527-3400

WASHINGTON
Suite 206, Lincoln Center
East Building
515-116th Avenue N.E.
Bellevue 98004 (206) 455-1903

THE PARTNERSHIP

IBI
Group

IBI Group practices in the fields of transportation, regional and resource planning and facilities design, together with the provision of economic, management science, project management, and other skills necessary to carry an engagement through all the stages that may be required from broad policy development to a physical facility design.

TRANSPORTATION
- Transportation Planning
- Transit Planning and Operations
- Traffic Management and Control
- Transport Policy
- Freight and Commodity Transportation
- Aviation and Airport Systems
- Rail Operations
- Port and Marine Operations

URBAN AND REGIONAL PLANNING AND DEVELOPMENT
- Urban and Regional Development
- Housing Policy and Planning
- New Town Planning
- Official Plans and By-Laws
- Tourism and Recreation
- Resources and Energy Planning and Development

ARCHITECTURE AND FACILITIES DESIGN
- Housing Projects and Commercial Developments
- Hospitals, Institutions and Community Facilities
- Transportation Ways and Terminals
- Space Planning
- Urban Design and Subdivision Planning

ECONOMICS AND MANAGEMENT SCIENCES AND SERVICES
- Real Estate Economics
- Economic and Financial Analyses
- Environmental Impact and Planning
- Policy Planning and Research
- Communication and Information Systems
- Project Management

SCOPE OF PRACTICE

IBI Group

The IBI Group provides government with a broad range of services from initial surveys and evaluation of development alternatives to preparation of official policies and land use regulations. Ongoing advisory services in implementation, monitoring, and plan and policy changes are also provided. Preparation of policy documents and official plans and the provision of advisory services have been undertaken for all levels of government.

Services offered to private sector clients range from preliminary market feasibility studies to overall planning of new towns and major tourist resorts involving thousands of acres of land. Some of the specialized services offered by the IBI Group include negotiation of approvals/agreements with approving authorities, marketing strategies, and project management and corporate planning assistance.

URBAN AND REGIONAL DEVELOPMENT

- Assessment of Development Potential
- Development of Statistical and Modelling Techniques for Allocating and Distributing Growth
- Economic Base Studies: Basic-Non-Basic Ratios, Economic Linkages, Multiplier Effects, Population and Housing Increments
- Identification of Cost and Revenue Implications of Alternative Forms of Development
- Socio-Economic Inventories and Impact Assessments: Environmental Management.

HOUSING POLICY AND PLANNING

- Market Analysis
- Analysis of Housing Supply Factors: Land Assembly and Servicing Requirements, Material Supply Logistics, and Unit Costing
- Demand Allocations on the Basis of Affordability and Housing Preferences
- Implementation of Management Systems for Project Monitoring and Control.

PLANNING OF NEW TOWNS

- Development of Overall Concepts of Structure and Density
- Detailed Planning of Road Systems, Public Transportation, Housing, Commercial and Industrial Development, and Community Services
- Project Management and Corporate Planning Assistance

OFFICIAL PLANS, LAND USE REGULATIONS, AND ADVISORY SERVICES

- Preparation of Regional Plans, Municipal General Plans, and Zoning and Development Control By-Laws
- Planning Analysis and Recommendations; Ongoing Advisory Services
- Expert Testimony at Annexation and Other Official Hearings
- Preparation and Negotiation of Agreements.

TOURISM AND RECREATION

- Inventory of Existing Facilities and Resources and Levels of Use
- Market Demand, Including Analyses of Spending Patterns, Entry by all Modes of Transportation, and Projections of the Rate and Pattern of Growth
- Development of Tourism/Recreational Plans, Including Environmental, Social, and Economic Investigations of Site-Specific Opportunities
- Development of Phasing, Budgeting, and Monitoring Programs.

RESOURCE AND ENERGY PLANNING AND DEVELOPMENT

- Establishment of Guidelines for Resource Development: Coal, Hydroelectric, Oil and Gas, and Heavy Oils and Tarsands
- Route Selection and Evaluation; Hydroelectric Transmission, Pipelines
- Evaluation of the Impact of Land Use Policy Decisions on Direct and Indirect Energy Consumption; Policies and Measures to Reduce Energy Demand
- Electric Power Planning, Including Evaluation of Alternative Heating Systems and Preparation of Market Penetration Estimates.

URBAN AND REGIONAL PLANNING AND DEVELOPMENT

IBI
Group

The IBI Group and its architectural affiliates provide total services for public and private sector clients in the development of residential, commercial, industrial, community, and institutional facilities.

The full scope of services covers market surveys, site selection, economic studies, preliminary and detailed facility and subdivision designs, presentations for public participation and planning approvals, contract documentation, construction supervision, and advice on management operation.

An affiliate of IBI - Beinhaker/Irwin Associates, Architects, Engineers, Planners, has received several national awards in housing design and urban design.

HOUSING PROJECTS AND COMMERCIAL DEVELOPMENTS
- Market Analysis
- Site Selection
- Preliminary Site Designs and Financial Pro Forma
- Architectural Design (Through Architectural Affiliates)
- Contract Documentation
- Construction Supervision.

HOSPITALS, INSTITUTIONS, AND COMMUNITY FACILITIES
- Role Studies and Regional Organization
- Health Services Planning
- Preparation of Hospital and Recreation Master Plans
- Design and Space Analyses: Evaluation of Alternative Systems
- Preparation of Site Designs and Architectural Drawings (Through Architectural Affiliates)
- Facilities Design and Functional Programming.

TRANSPORTATION WAYS AND TERMINALS
- Planning and Design of Rapid Transit Systems; Trackbeds, Grade Crossings, Vehicle Maintenance and Storage Buildings, Stations, and Parking and Bus Facilities
- Preparation of Airport Master Plans
- Planning, Site Selection, and Design of Railway and Airport Terminals and Related Facilities
- Groundside Planning, Including Design of Alternative Airport Access Approaches for Various Modes of Transport.

SPACE PLANNING
- Determination of Space Needs
- Design of Building Layout
- Gaming to Define Client Needs.

URBAN DESIGN AND SUBDIVISION PLANNING
- Development of Servicing and Land Use Concepts
- Design of Plans of Subdivision
- Preparation of Development Plans
- Negotiations with Approving Authorities; Public Participation.

ARCHITECTURE AND FACILITIES DESIGN

IBI
Group

IBI staff provide a full range of economic, financial, environmental, policy planning, and computer, communication, and information services to support the transportation, urban and regional planning, and architectural and facilities design practices. Project management services are also available to carry projects through from concept to implementation.

REAL ESTATE ECONOMICS
- Behavioral and Attitudinal Market Research
- Economic Base Studies
- Studies of Land Development Potential
- Market Potential Analyses for Retail, Office, Hotel, and Other Types of Space, Including Current Productivity of Space, Future Requirements Based on Alternative Assumptions for Population and Employment Growth, and Alternative Development Strategies.
- Studies of the Impact on Rental Values and the Economic Rate of Return of Specific Real Estate Projects.

ECONOMIC AND FINANCIAL ANALYSES
- Financial Consequences of Alternative Urban and Regional Development Plans, Including Analyses of Costs and Benefits and Burden of Growth on the Existing Tax Base
- Cost-Benefit Analysis of Alternative Road and Public Transit Investments
- Development and Application of the "Strategy Table" Method of Plan Presentation.

ENVIRONMENTAL IMPACT AND PLANNING
- Environmental Impact: Pipelines, Transmission Lines, Rapid Transit Lines, Airports
- Community Impact: Resource Developments, Pipelines, Rapid Transit Stations.

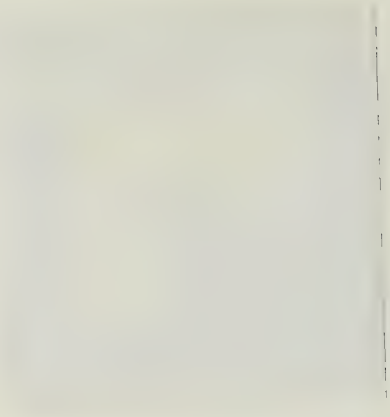
POLICY PLANNING AND RESEARCH
- Implications of Alternative Forms of Ownership, Management, Organization
- Effects of Foreign Ownership
- Opportunities for Technological Innovation.

COMPUTER, COMMUNICATION AND INFORMATION SYSTEMS
- Computer Models
- Electronic and Microprocessor Systems
- Planning Information and Data Systems.

PROJECT MANAGEMENT
- Management of Construction Projects
- Management of Consulting Teams
- Management of Special Project Groups.

ECONOMICS AND MANAGEMENT SCIENCES AND SERVICES

IBI Group



The Group's experience covers the full scope of transportation system planning including economic feasibility studies, environmental impact assessments, the development and use of simplified and comprehensive land use and transportation models, financial analysis, and operational studies of traffic and public transportation.

Staff of IBI have conducted public transportation planning studies for various urban regions and cities, including design of rapid transit systems. IBI staff have also carried out a number of traffic operations and functional planning projects which have included analyses of parking, signals, markings and geometrics, and implementation of computerized traffic control and traffic management systems.

The Group is also active in airport and port systems planning. These studies have involved planning the interfaces between air transport and urban transportation and between the port and the connecting highway and railroad links.

TRANSPORTATION PLANNING
- Regional Transportation Plans
- Organization of Regional Transportation
- Multi-Modal Transportation Modelling

TRANSIT PLANNING AND OPERATIONS
- Management and Marketing Studies
- Operational Improvements
- Transit Systems Planning
- Para-Transit Systems
- Transit Information and Control

TRAFFIC MANAGEMENT AND CONTROL
- Traffic Management
- Computerized Traffic Control Systems
- Off-Line Signal Optimization Programs
- Traffic Engineering and Parking

TRANSPORT POLICY
- Evaluation of Subsidies and Incentives
- Organizational and Administrative Options
- Traffic Engineering and Parking

INTERCITY PASSENGER AND FREIGHT TRANSPORTATION
- Commodity Movement Systems: Grain, Potash, Containers
- Intercity Passenger and Freight Systems
- Crude Oil and Natural Gas Systems
- Urban Goods Distribution

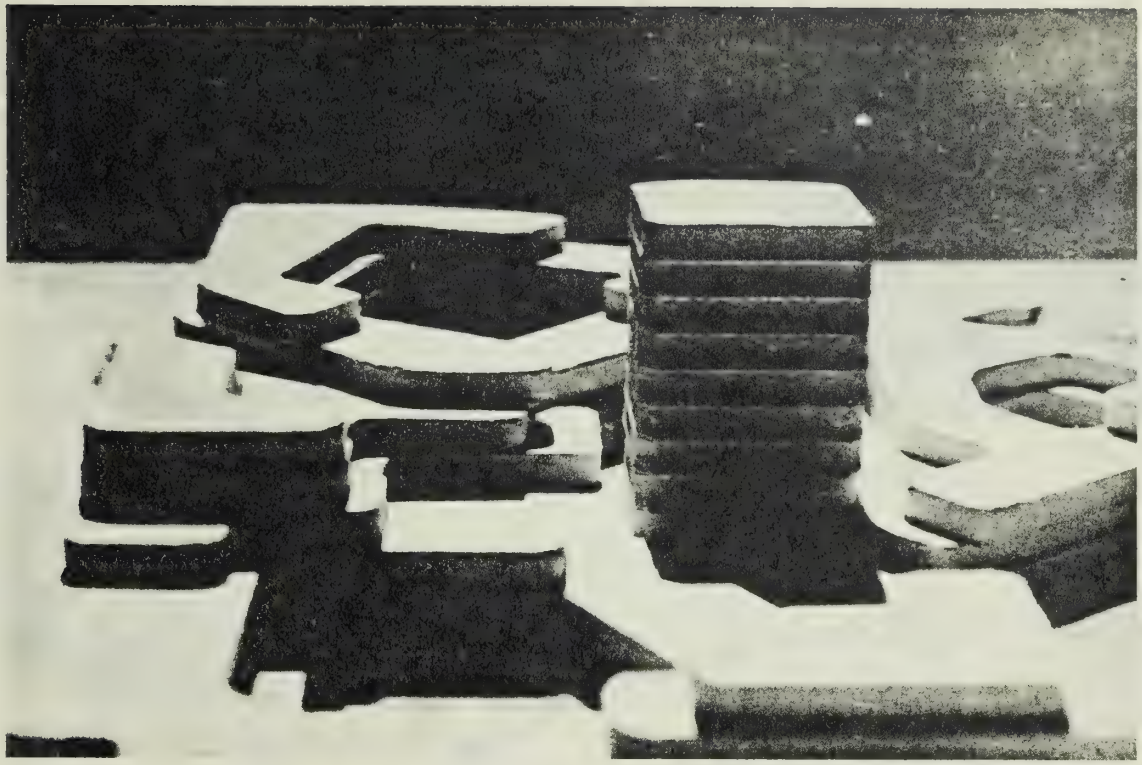
AVIATION AND AIRPORT SYSTEMS
- Passenger and Air Cargo Forecasts
- Airport, Airside, and Air Space Requirements
- Ground Transportation Needs
- Airplane and Crew Scheduling

RAIL OPERATIONS
- Traffic Forecasts
- Feasibility Studies - Improvements, Extensions
- Freight Services Planning
- Rail Relocation and Redevelopment
- Freight Services Planning

PORT AND MARINE OPERATIONS
- Traffic Forecasts
- Port Capacities and Terminal Requirements
- Ferry Services, Inland Waterways
- Allocation and Use of Longshore Labour.

TRANSPORTATION

IBI Group



This study was undertaken to assess the economic aspects of a proposal for total redevelopment of a downtown block. The new development, which was to include residential and commercial uses, was proposed by a community cooperative seeking to encourage downtown living.

The review considered the existing land ownership, uses, and rents, and the allowed zoning. The market value of the land appropriately zoned in the area was estimated. In consultation with a real estate consultant and drawing upon the expertise of our own professionals, the construction costs, rents produced, and maintenance costs required by the proposed development were estimated. Three estimates of land value were developed based on:

1. existing structures and rents
2. redevelopment as a single unit to highest and best use under the present allowed zoning
3. redevelopment to the proposed use.

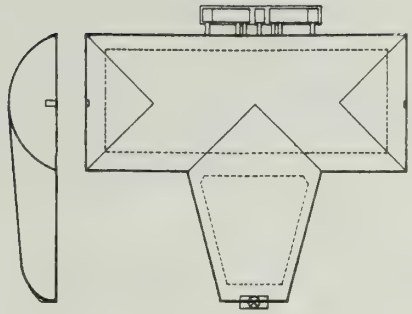
The report showed that the proposition was economically feasible as a cooperative, provided senior governments or other sources were prepared to make the required capital sums available.

Feasibility of a Downtown Residential/ Commercial Complex

Client - A downtown residential cooperative

IBI Group

side elevation



roof plan



exterior view



interior view

The British Columbia Ministry of Recreation and Conservation retained IBI Group to prepare a comprehensive report on air supported structures.

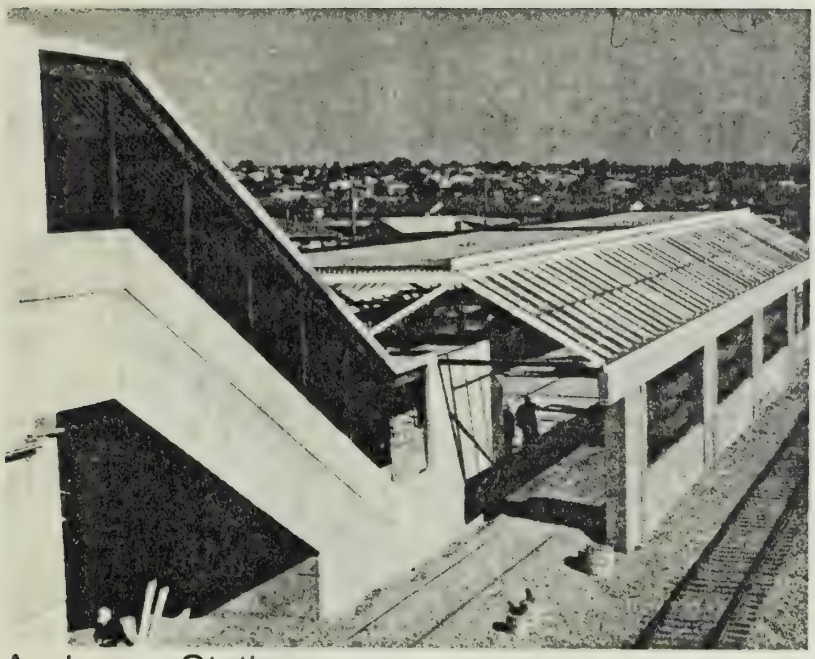
Included in the report is an examination of the functional suitability of air structures for recreational activities, of life cycle costs and benefits of air supported structures, and a review of unique aspects of air structure design.

A "Guidelines for Purchase" document, prepared as part of the report, provides the necessary framework for user groups to evaluate various "off the shelf" air structure building alternatives.

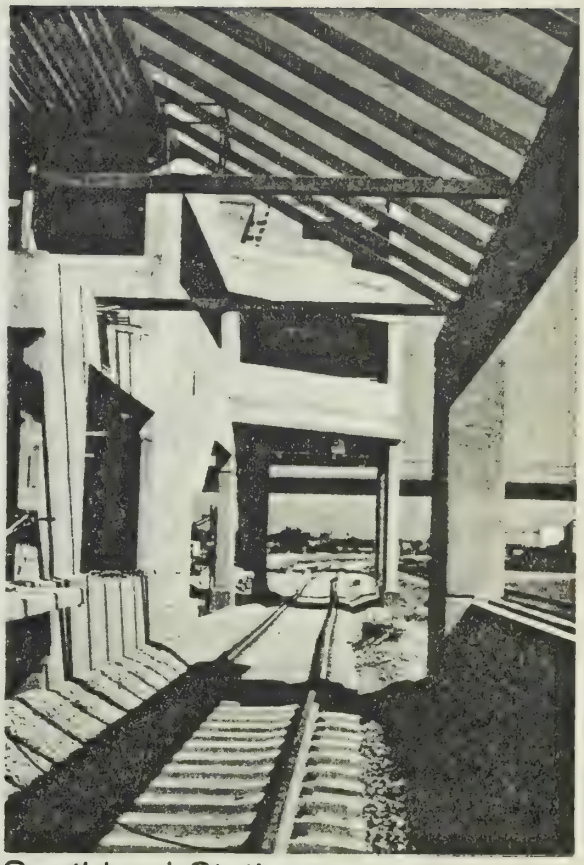
Report on Air Supported Structures

Client - British Columbia Ministry of Recreation and Conservation

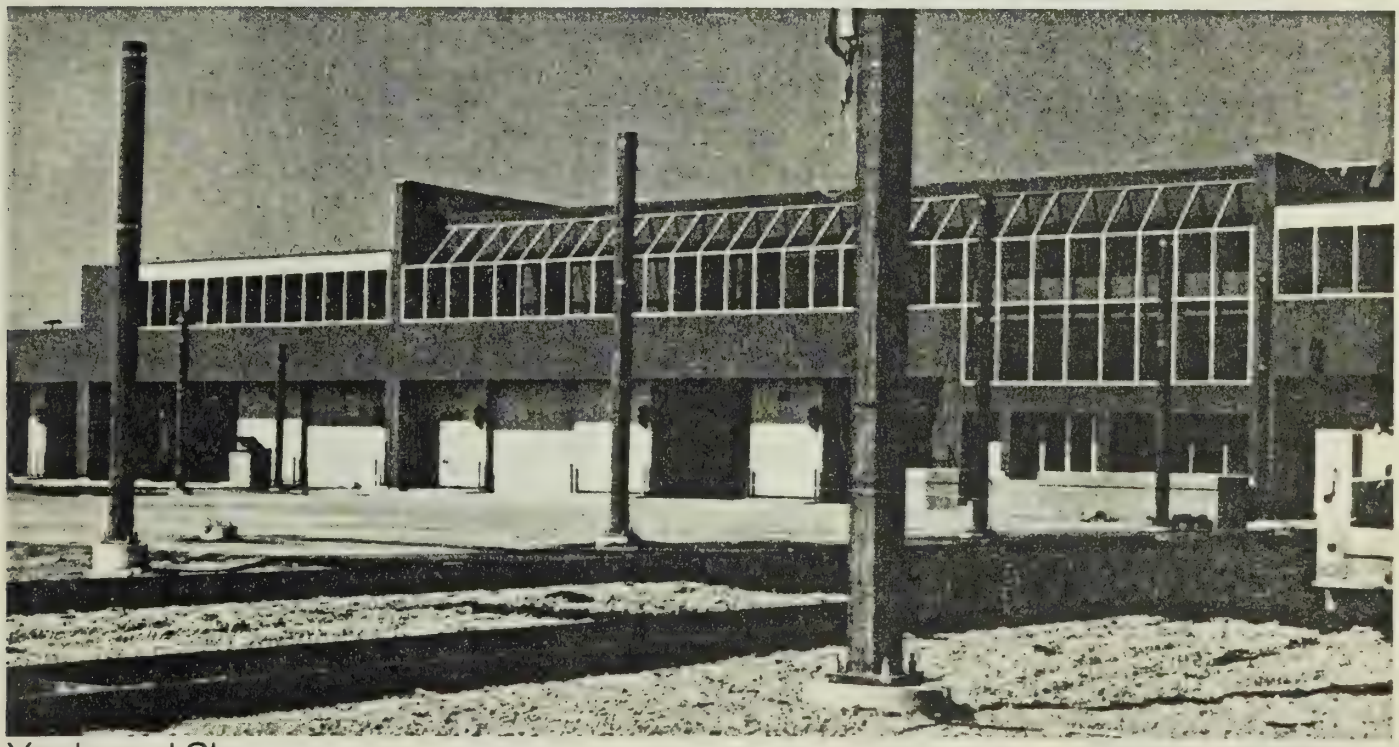
IBI Group



Anderson Station



Southland Station

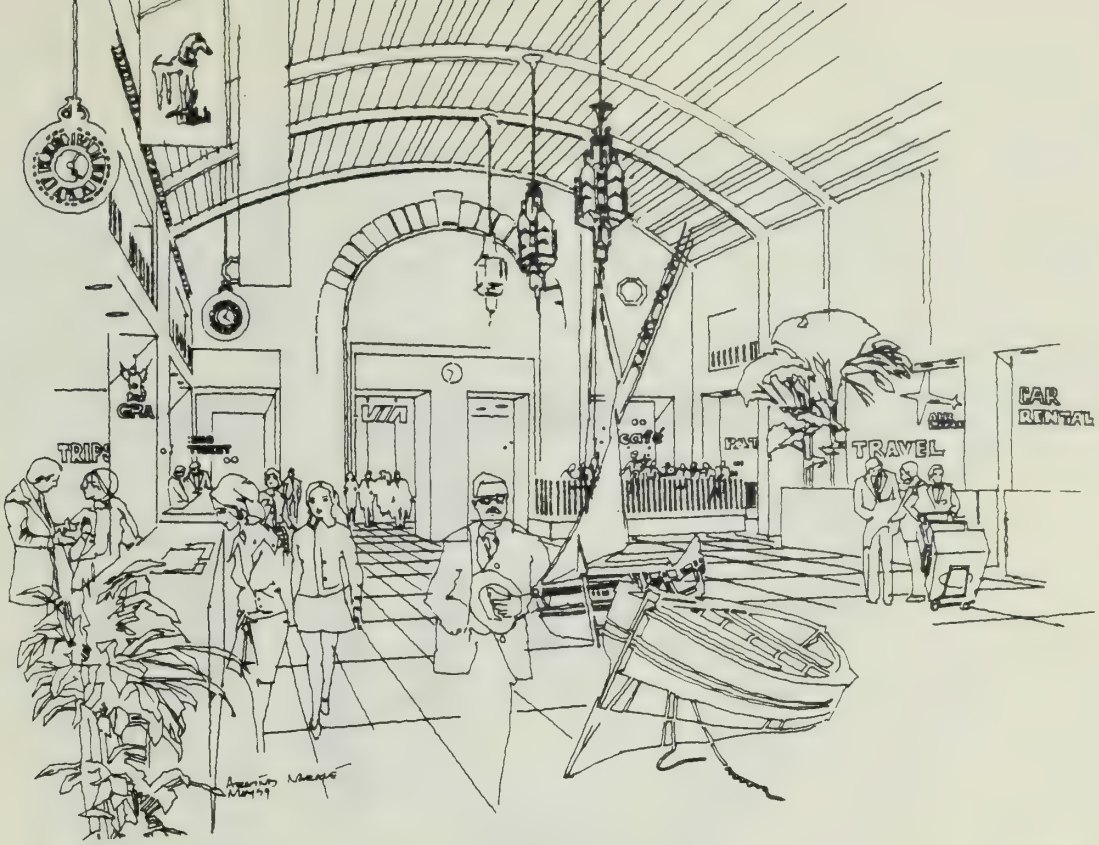


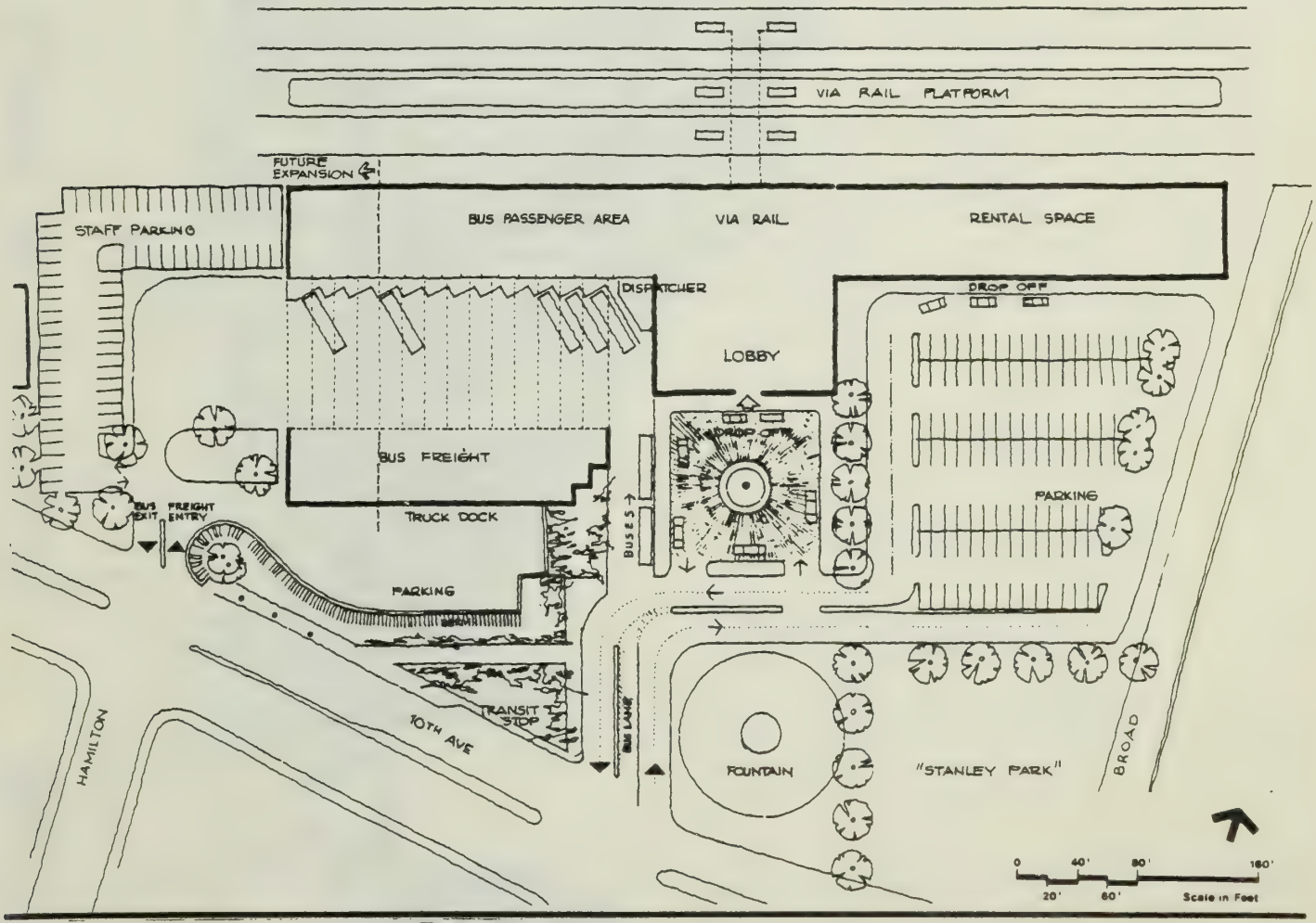
Yards and Shops

Light Rail Transit

Calgary, Alberta

IBI



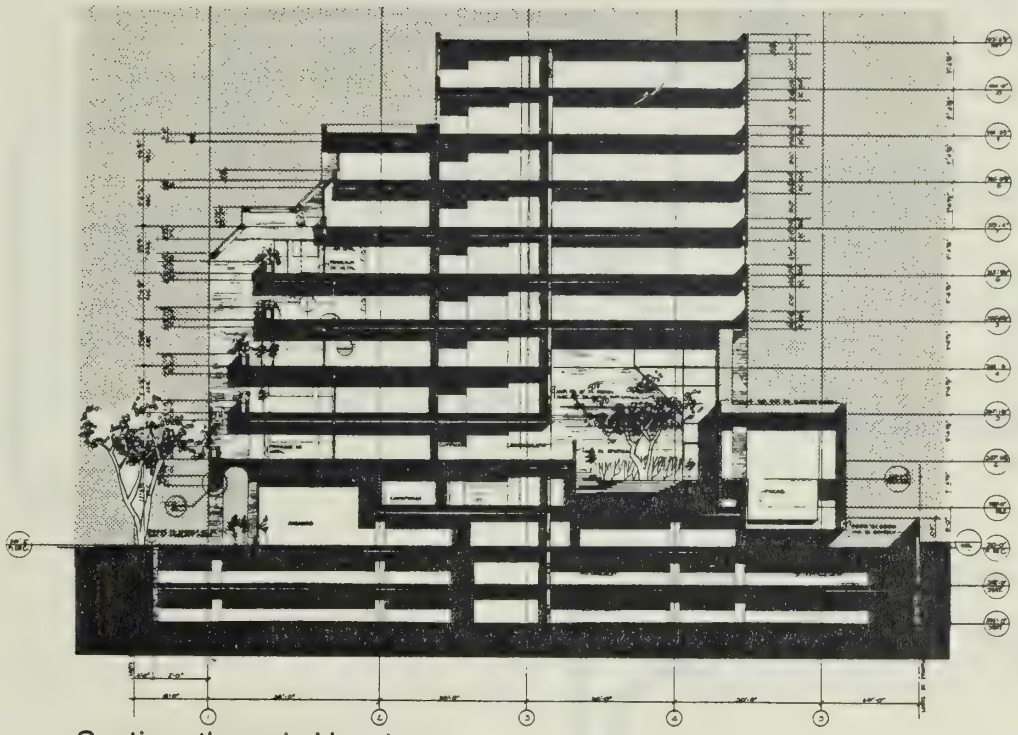


Regina Multi-Modal Transportation Terminal

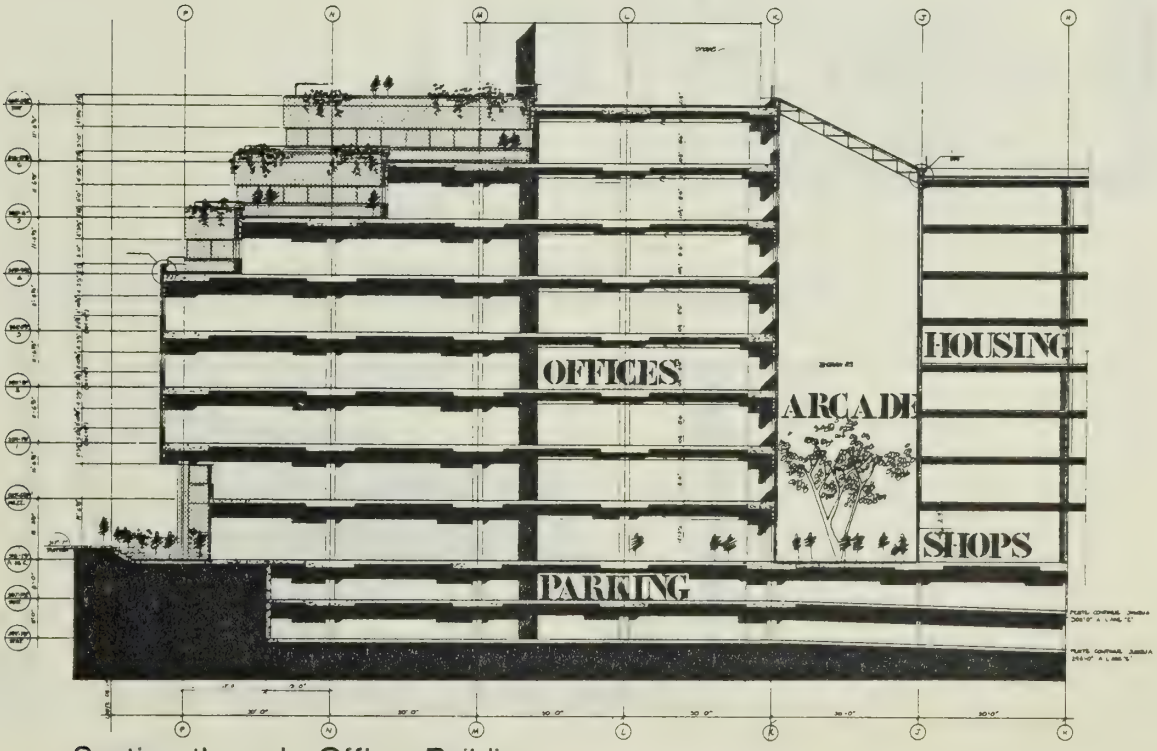


Place de la Colline

Beinhaker
Architecte



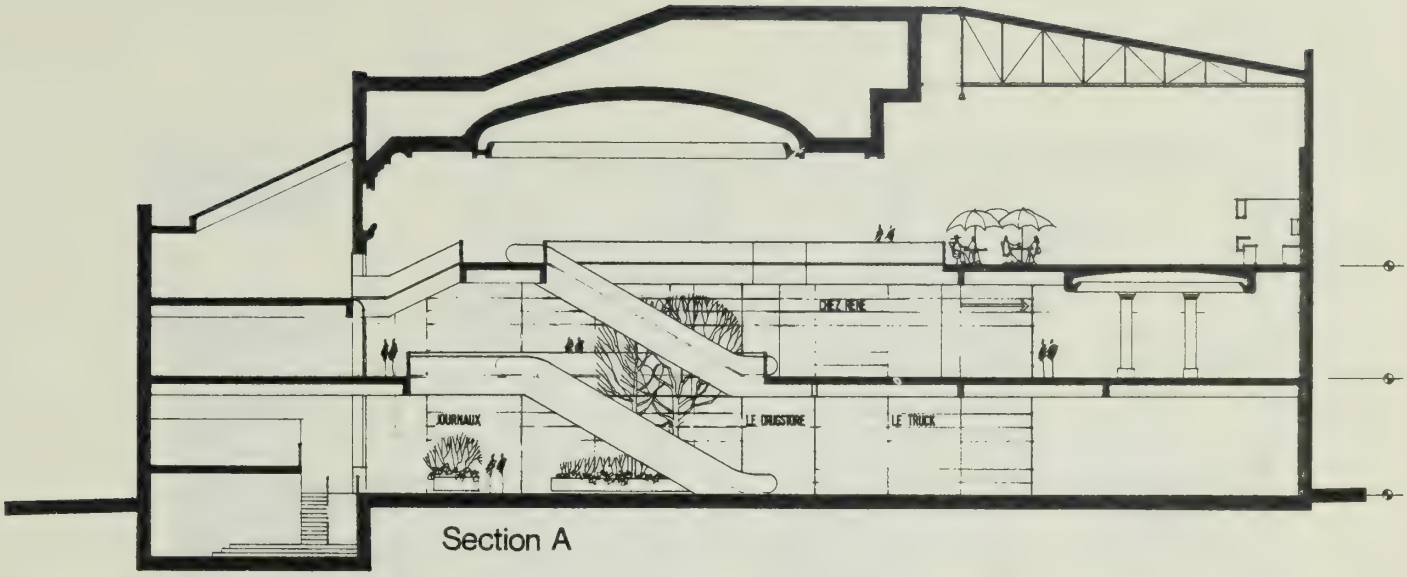
Section through Housing



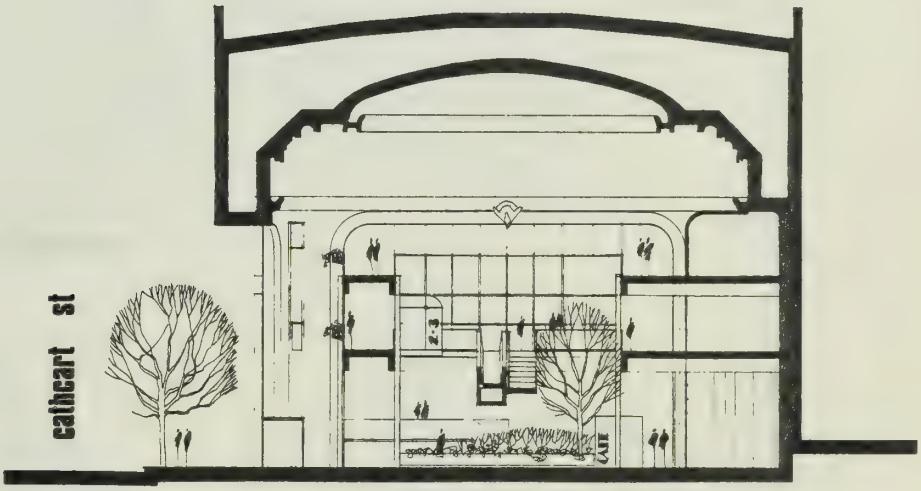
Section through Office Building

0 4 8 16 32′

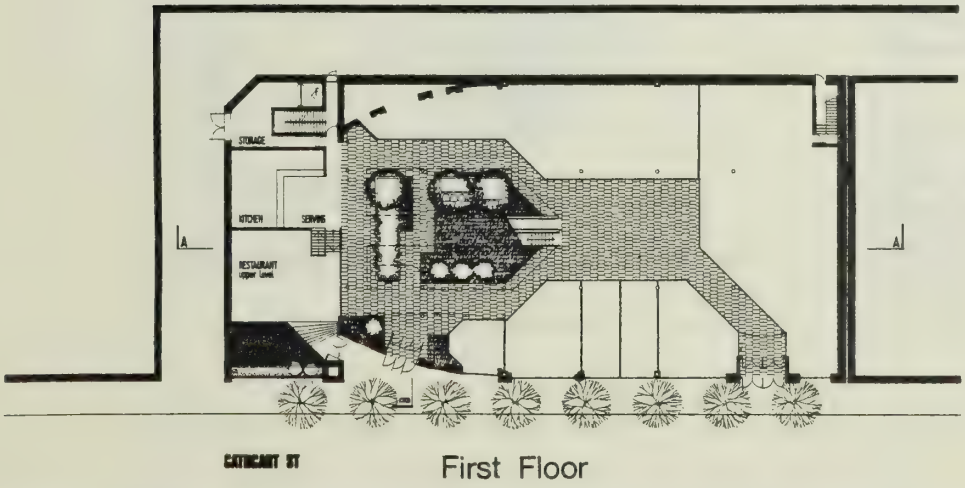
Place de la Colline
Ville de Québec, Québec



Section A



Section B



First Floor

Redevelopment of the Palace Theatre

IBI



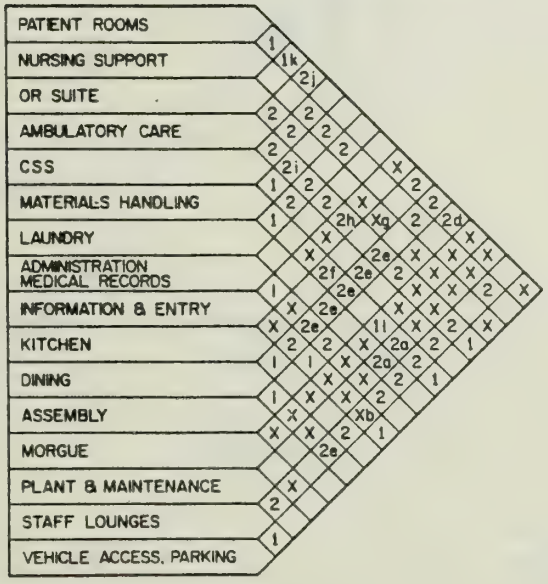
PERFORMANCE STANDARDS

	QUALITATIVE											CHANGE		PHYSICAL				
	VIEW	SUN ORIENTATION	DAYLIGHT	*COMFORT*	SECURITY	CONTROLLED ACCESS	IDENTIFICATION	PRIVACY	ISOLATION	STERILITY	EXPANSION	RE-ARRANGEMENT	SERVICES	BUILT-IN EQUIPMENT	SPAN	LOAD	ENVIRONMENTAL CONTROL	SNOW REMOVAL
PATIENT CARE	○	○	●	●	●	●		●	○	○	○	○	○	○			○	
NURSING SUPPORT					$○_m$	○	○				○	○					$●_a$	
OR SUITE						●			●	●	○	○	$●_b$	○		○	$●_c$	
PATIENT RELAXATION	●	●	●	●			○											
STAFF RELAXATION	○	○	○	●														
VISITING			○	○			●	○										
WAITING	○	○		●			●											
EATING	○	○	●	●			○											
ASSEMBLY (Training, Meeting)			○	○			○				○			○				
INFORMATION OR CONTROL				○			●				○							
ADMINISTRATION			○	○	○		○			●	●							
REGISTRATION, DOCUMENTATION				○	○		○			○								
AMBULATORY CARE			○	$○_d$	$○_m$	○	●	○		●	●	●	○		$○_g$	●		
CENTRAL MATERIALS HANDLING					$○_m$	○			○	●	●	$○_f$	$○_j$		$○_j$			
FOOD PREPARATION			○		○	●			○		○	$○_g$	○		○	●		
AUTOPSY					●	●		○					○		○	$○_n$		
COUNSELLING			○	○			●											
STAFF CHANGE OR LOCKERS			○	○	○	○		○			○	○						
PLANT & MAINTENANCE					○	○			○				○	●	●			
TRUCK (Goods) ACCESS						○	○								○			●
CAR (Passenger) ACCESS						○	●				○		$○_j$					●
AMBULANCE					$○_m$	○							$○_i$		○		$●_k$	●
HELICOPTER						○	○									○		○

NOTES

a. INTERIOR SPACES
b. PIPED GAS
c. CEILING
d. WAITING
e. PHYSIO OR X-RAY EQUIPMENT
f. STEAM IN CSR
g. GAS OR STEAM
h. EXHAUST
i. PLUGS
j. AUTOCLAVE UNIT
k. WARM
l. WATER
m. DRUGS

SPACE / FUNCTION RELATIONSHIPS



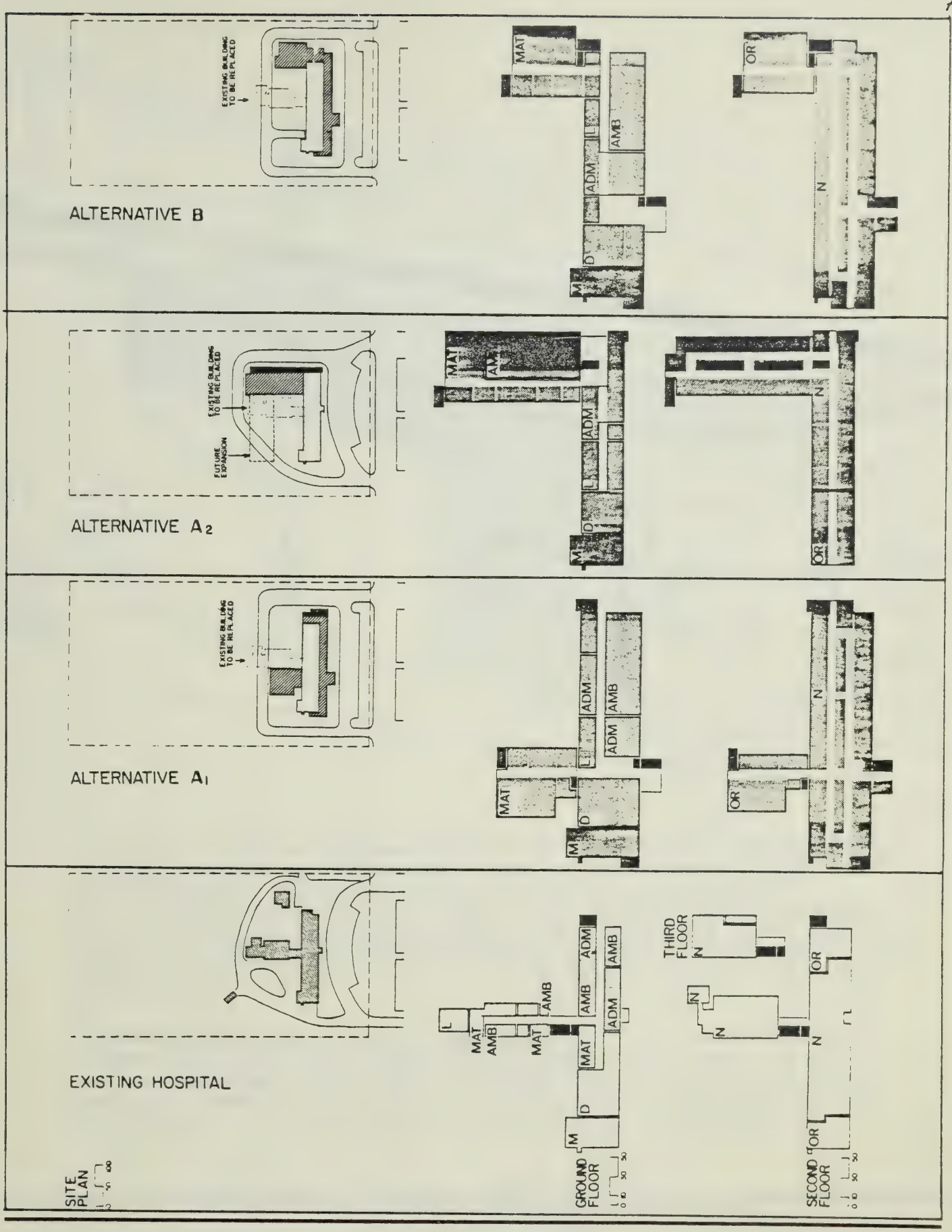
NOTES

a. MAINTENANCE
b. SEPARATE
c. COFFEE BREAKS
d. VISUAL CONNECTION POSSIBLE FROM LOUNGES AND DAY ROOMS
e. STAFF
f. GARBAGE, STORED FOOD, CART WASH
g. NOISE, SMELL, AIR CONDITIONING
h. EMERGENCIES SHOULD BE SEPARATE
i. NOT OFTEN
j. IN-PATIENT TESTS OR SERVICES
k. PARTICULARLY OBSTETRICS, SCU
l. USE OF LOADING DOCK

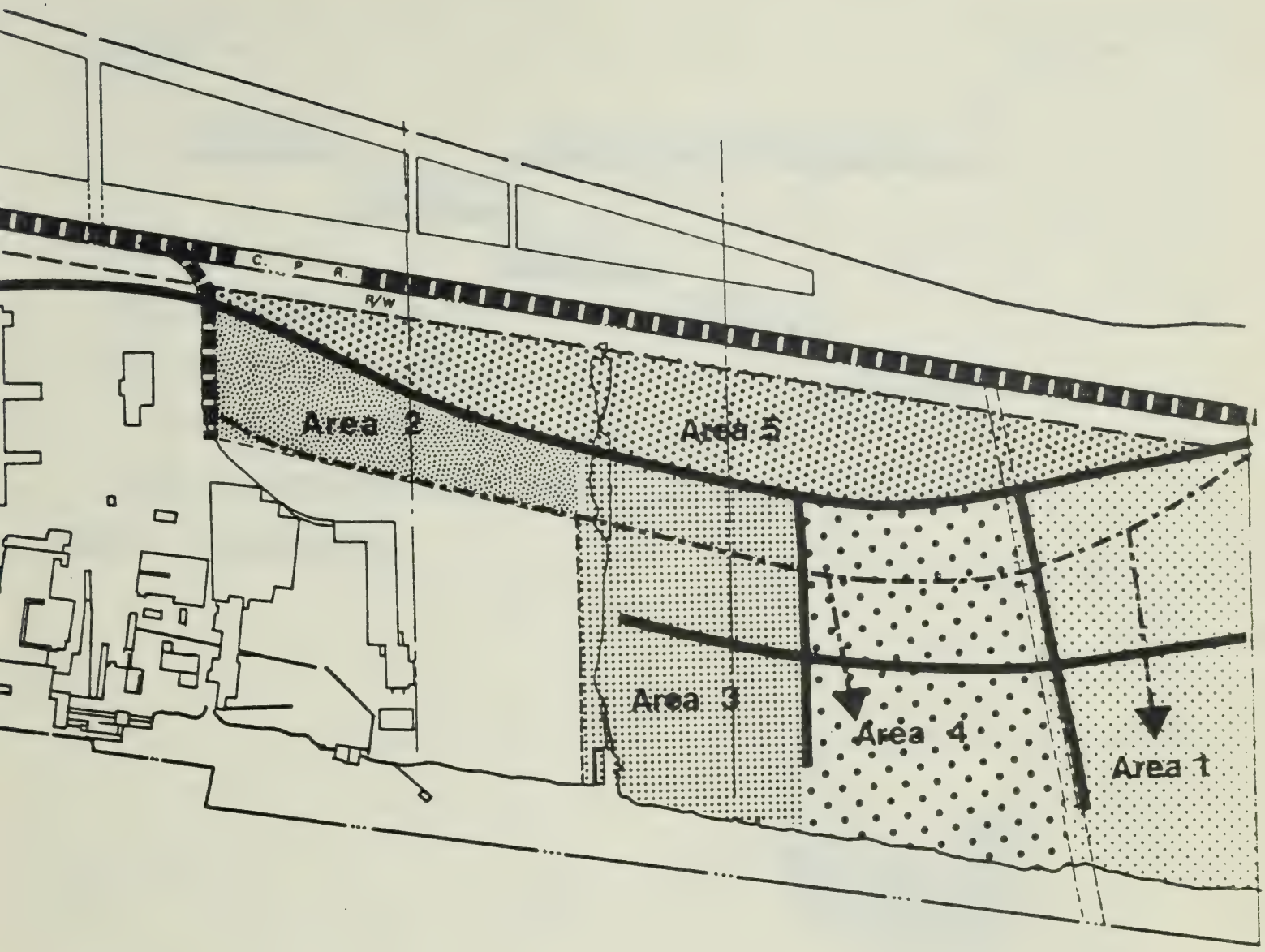
LEGEND

1 = PROXIMITY NECESSARY; REQUIRED BY WORK FLOW
2 = PROXIMITY USEFUL; DISTANCE BETWEEN SPACES SHOULD BE MINIMIZED
X = SEPARATION NECESSARY; ACTIVITIES ARE IN CONFLICT
O = NO REQUIRED RELATIONSHIP BETWEEN SPACES

A 77-A



Lady Minto Hospital
Site Feasability Study



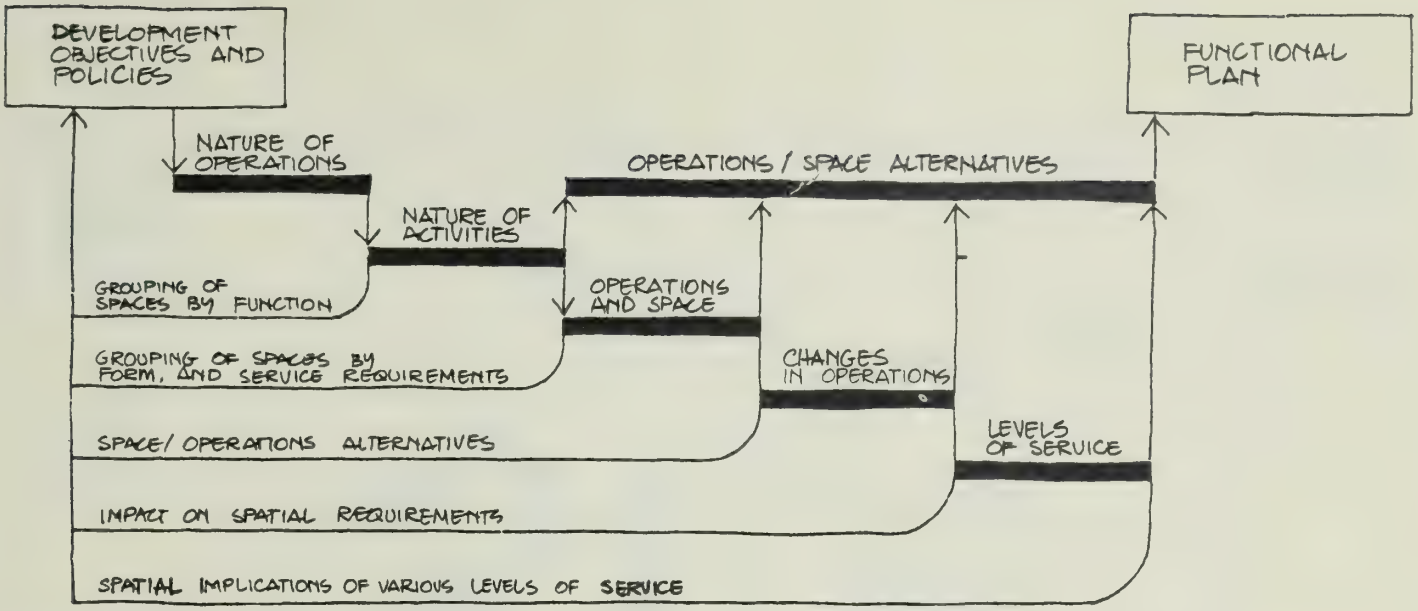
This project entailed the preparation of a market assessment, land use plan, financial analysis and implementation plan for some 200 acres in the Lower Mainland of British Columbia, suitable for industrial development. The absorption rate of industrial land in the region and the available competitive industrial land were identified. Concurrent with a market appraisal, some preliminary land use concepts for the development of the site were formulated on the basis of the site's physical characteristics and its potential access points.

Alternative development strategies were analyzed. The various marketing segments which the client might attempt to attract were examined in detail and the preliminary concepts were further developed. A preliminary financial analysis in terms of costs, rentals, and sales prices of various facilities was prepared. A strategy of phased development was recommended to the client.

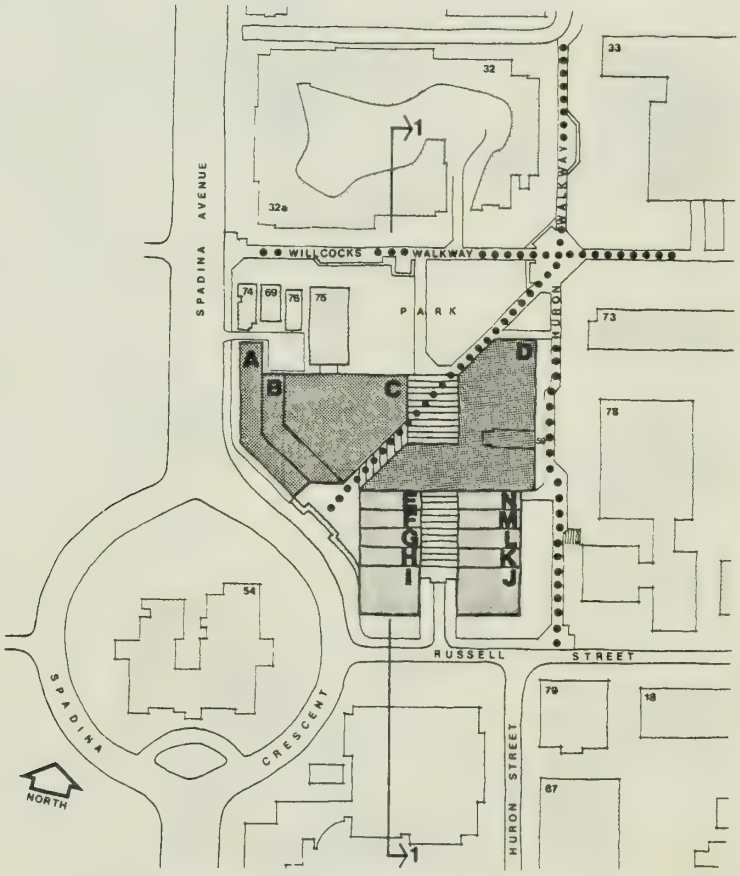
Industrial Development Feasibility

Client - Private Development Company

IBI Group



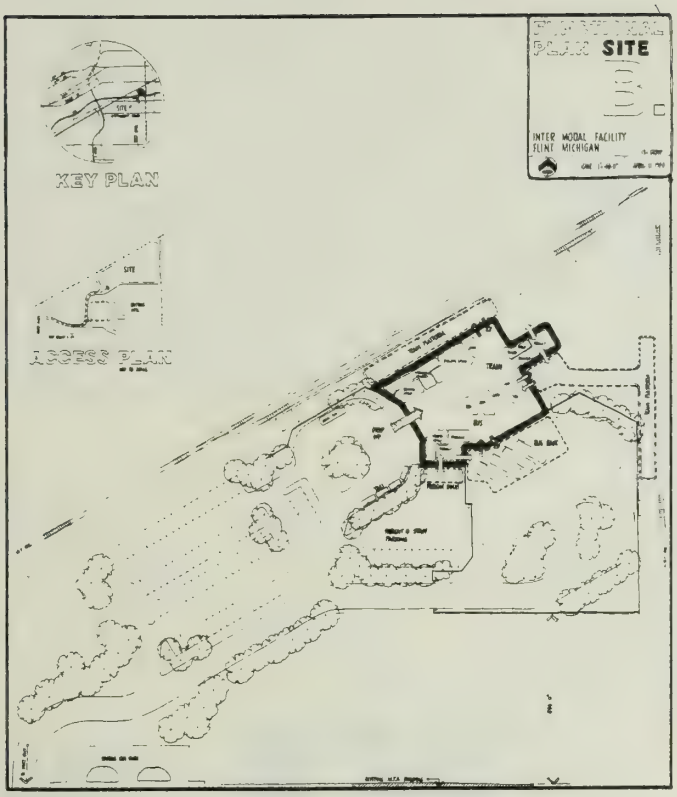
Space Programming

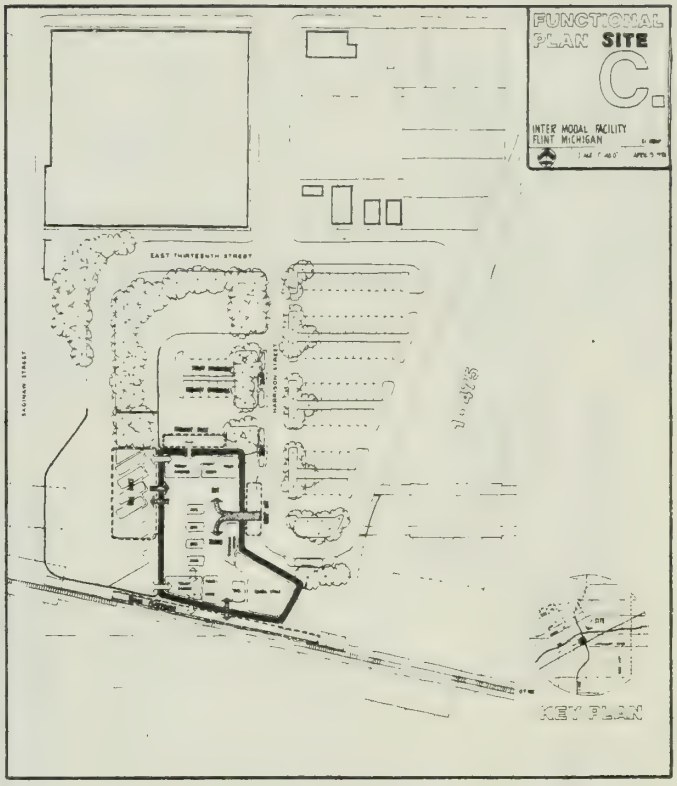


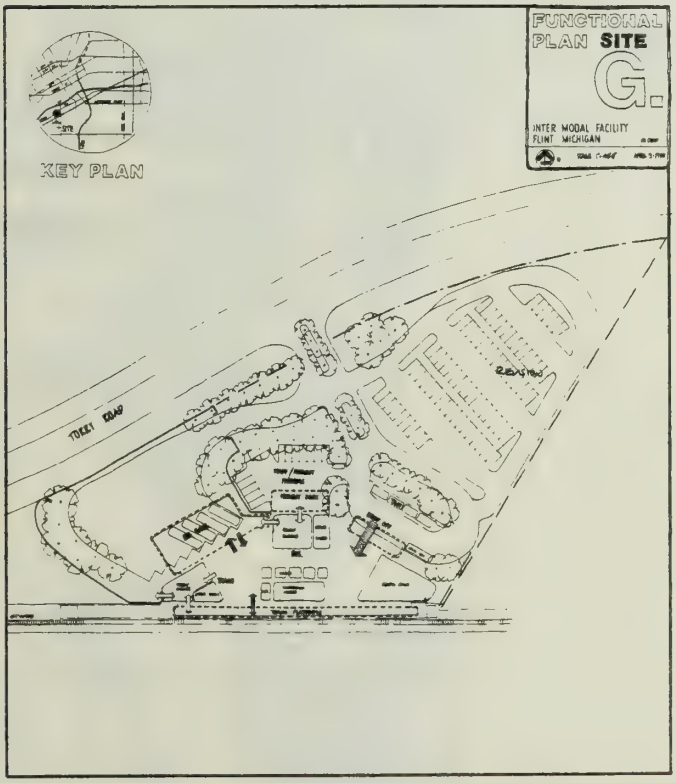
Site Development

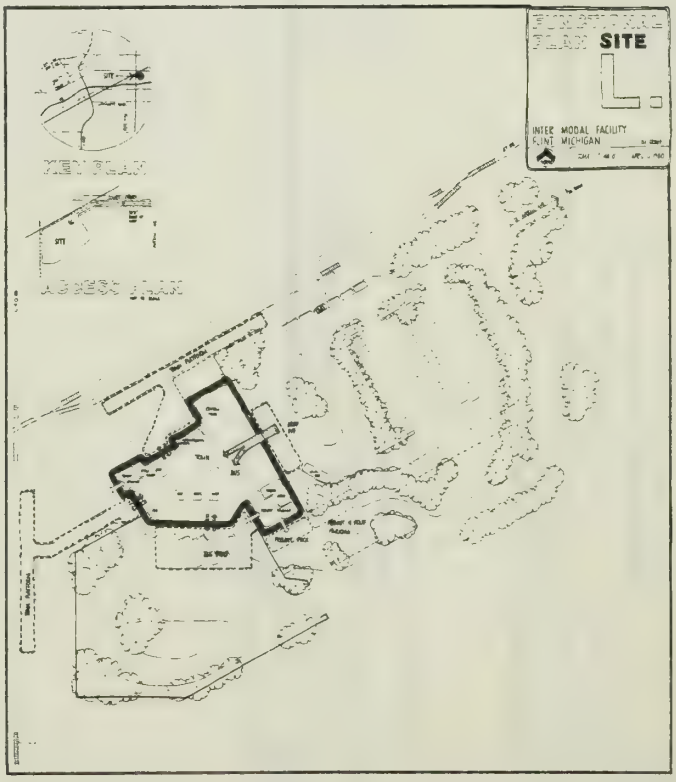


University of Toronto
Master Plan









Inter-Modal Terminal Studies

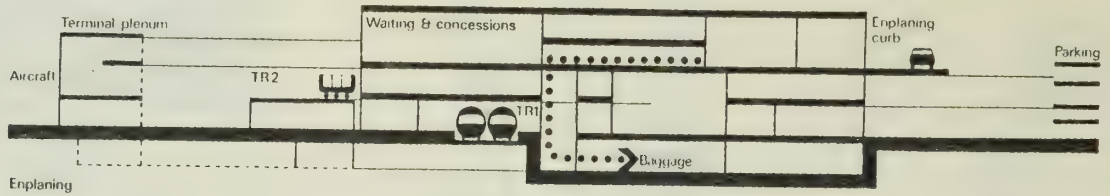
Flint, Michigan Mass Transit Authority

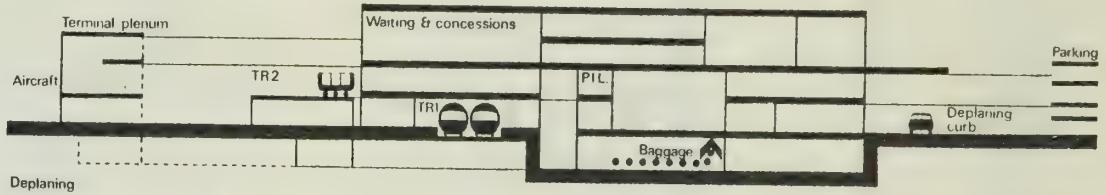
IBI

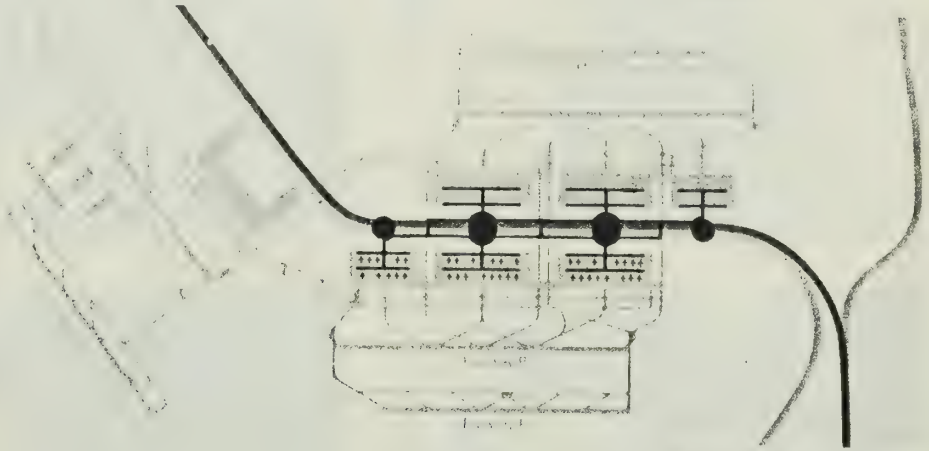
NEW MONTREAL INTERNATIONAL AIRPORT

MASTER PLAN AND TERMINAL CONCEPT

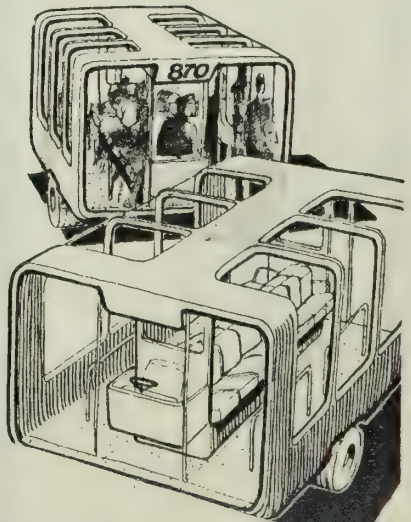
CLIENT: MINISTRY OF TRANSPORTATION
GOVERNMENT OF CANADA
1967 - 1971

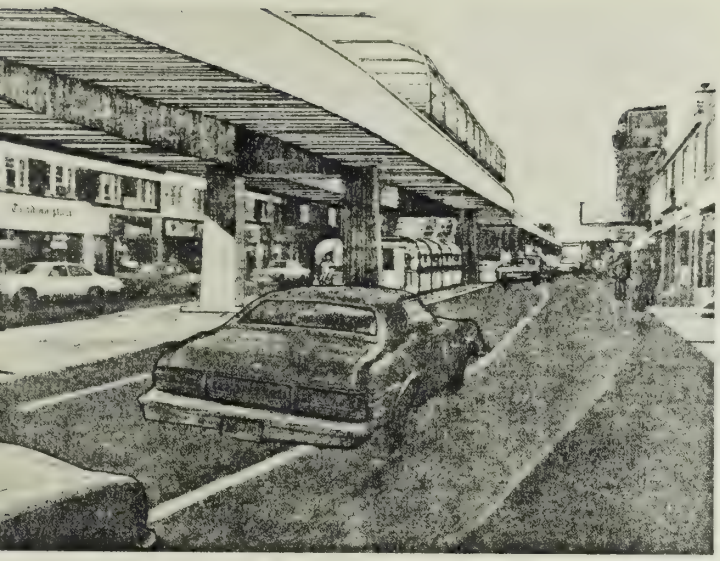




















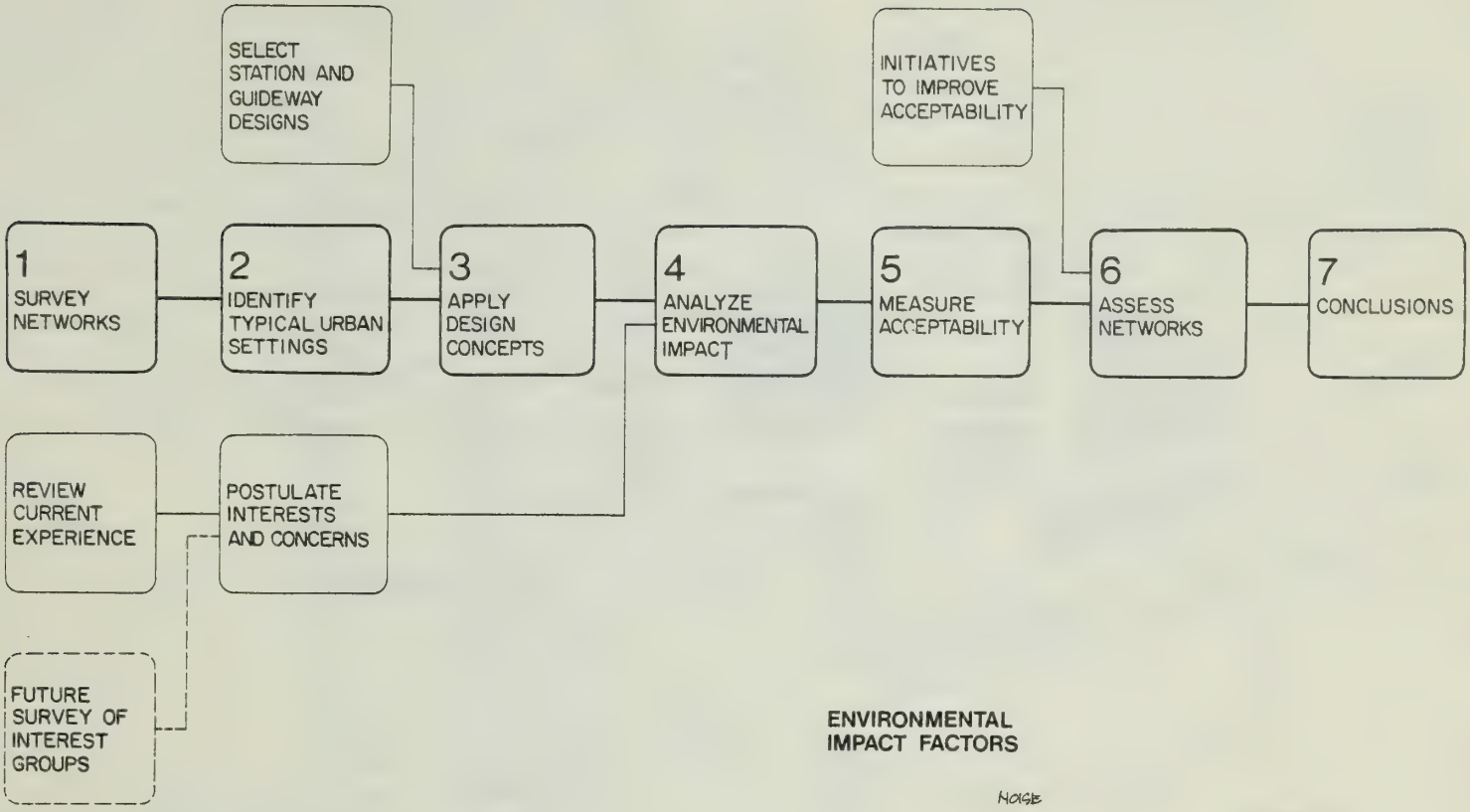
Elevated Transit

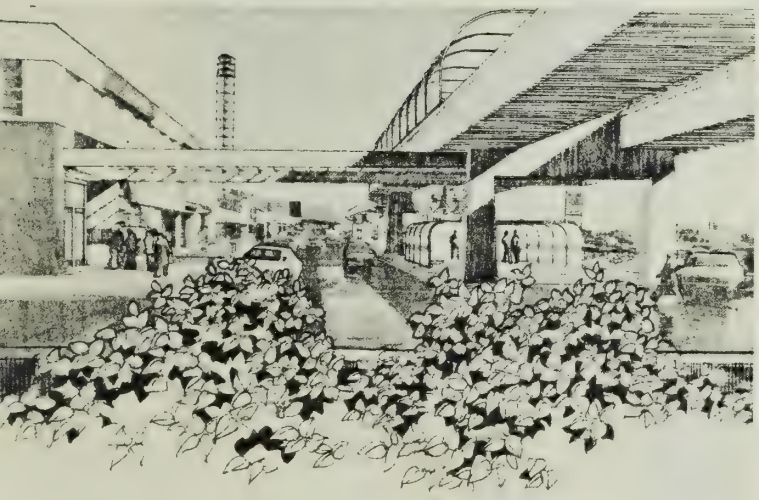
Environmental Impact and Acceptability

Client-Urban Transportation Development Corporation

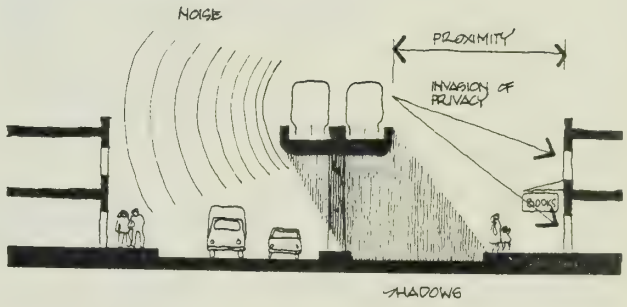
Beinhaker/Irwin Associates
Architects, Engineers, Planners

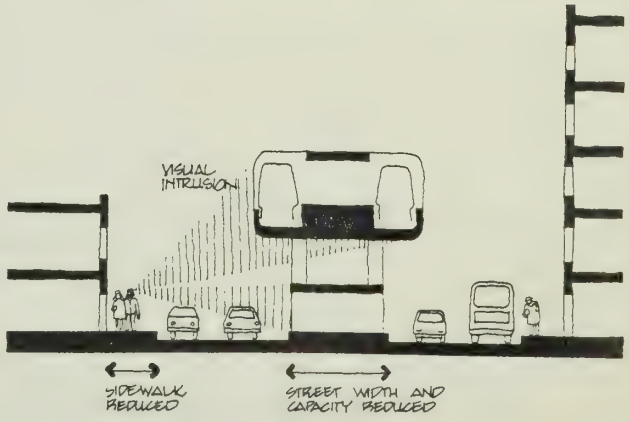
IBI
Group Affiliate





ENVIRONMENTAL IMPACT FACTORS





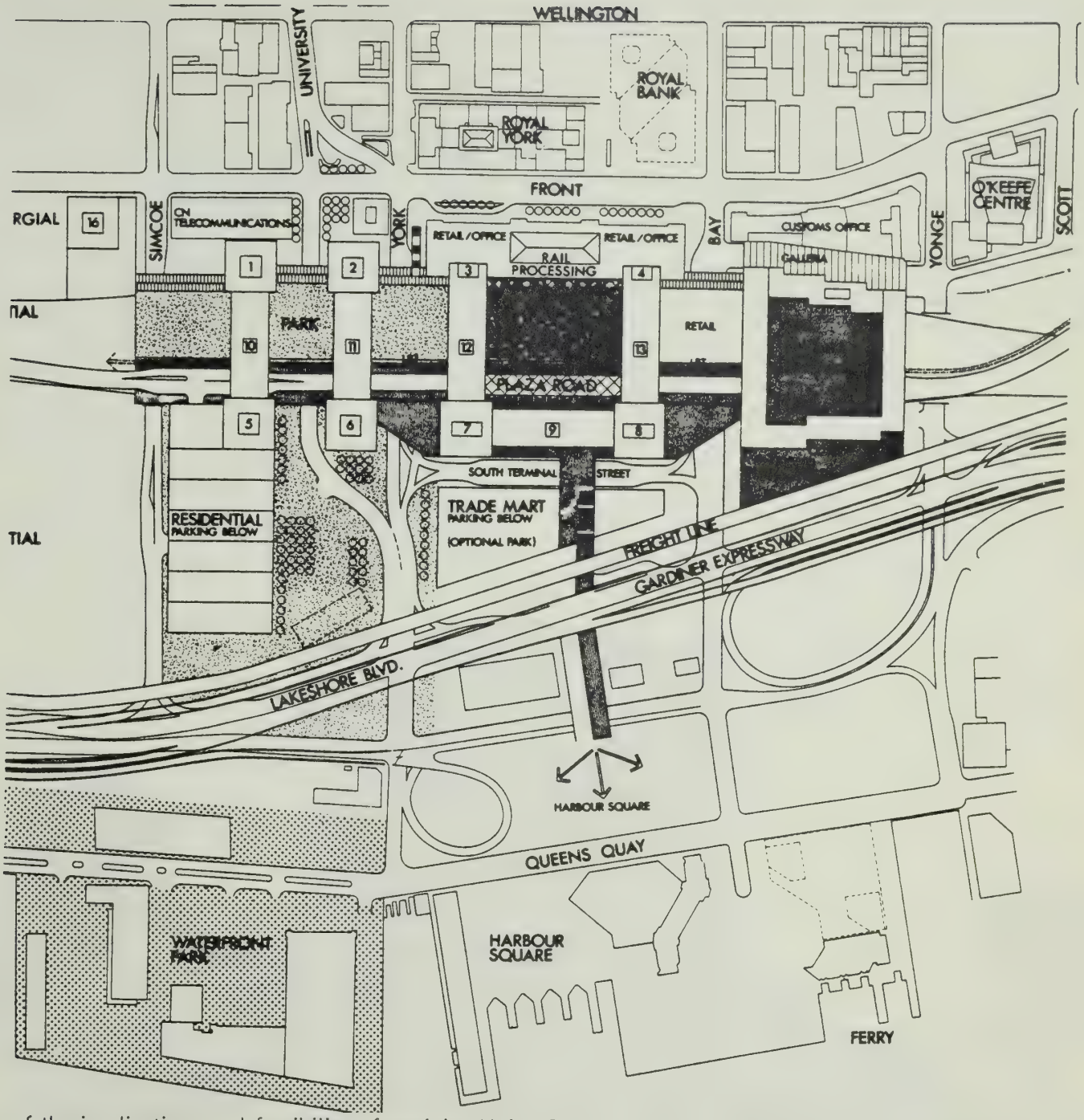
Elevated Transit

Environmental Impact and Acceptability

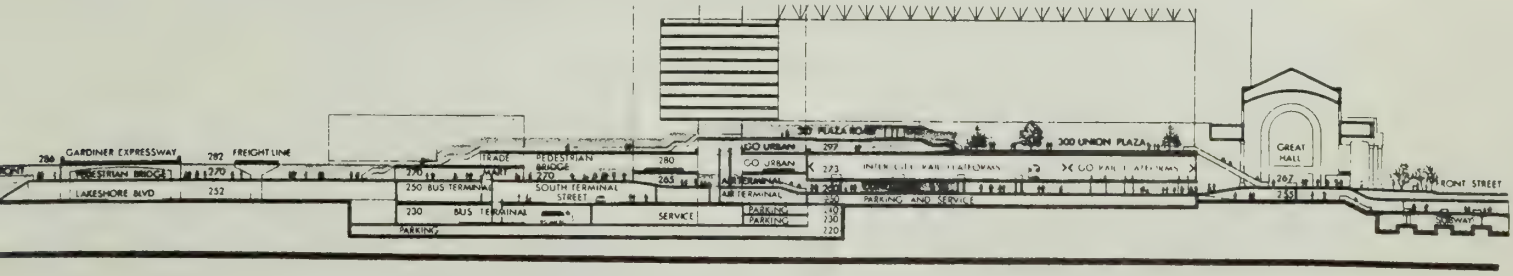
Client-Urban Transportation Development Corporation

Beinhaker/Irwin Associates
Architects, Engineers, Planners

IBI
Group Affiliate



Analysis of the implications and feasibility of retaining Union Station as part of the Metro Centre Development to function as the major transportation terminal in downtown Toronto.



Union Station
Transportation Terminal Feasibility Study

Client — City of Toronto

Economics Research Associates



Since our first study for Walt Disney Productions more than 20 years ago, ERA has completed over 2,000 assignments related to recreation and/or tourism. The world's oldest and largest management consultant firm to the leisure industry, ERA has pioneered the planning, development and operational phases for many of the world's major recreation, entertainment, education and tourist attractions.

ERA has provided advice and guidance to corporations, investment groups, financial institutions, foundations, municipal, state and national agencies and to many foreign investment groups and governmental agencies. ERA's team of specialists have extensive backgrounds in finance, economics, marketing, accounting and master planning in addition to "hands on" project management, implementation and operational expertise.

Typically, ERA provides the following scope of services to its recreation and tourism clients:

- Concept development and planning
- Site location analysis
- Market research
- Demand analysis
- Financial feasibility analysis
- Development strategies
- Master planning
- Economic impact analysis
- Operational audits
- Financial controls and planning
- Revenue/cost analysis
- Marketing and creative services
- Attractions/event management
- Recreation and educational programming
- Data collection and opinion surveys
- Reinvestment expansion strategies
- Expert testimony

These services are typically applied to a wide range of recreation and tourist oriented attractions, including existing, new and/or proposed: mass attendance attractions, such as theme parks, zoos, expositions and fairs, specialty entertainment facilities and tours; recreation facilities such as campgrounds, country clubs, ski resorts, health and exercise facilities, golf/tennis



clubs and commercial family recreation centers; exhibition and performance facilities such as cultural center, stadiums, arenas, museums and theaters; real estate facilities such as destination resorts and second home communities; and public recreation facilities such as local, state and national recreational areas.

Tourism

In the field of tourism, ERA's expertise is applied to forecast tourism trends and characteristics, to identify opportunities for development, to create effective promotional programs and to provide economic impact analyses. Many of ERA's tourism assignments focus on questions such as seasonality, length of stay, purpose of visit, expenditure patterns, energy impacts, ecologically developable natural resources and contra-seasonal business opportunities. ERA's tourism studies have included the states of: Alaska, Florida, California, Michigan, South Carolina, Maryland, Hawaii, Louisiana, Maine, Texas, Arkansas, Kentucky, Tennessee and New York.

Mass Attendance Facilities and Events

In the field of planning and programming mass attendance facilities and events - zoos, expositions and fairs, specialty entertainment facilities and tours - ERA is called upon more often than any other firm in the world. ERA's assign-

ments have included: Expo '74; Canadian National Exposition; Wet 'N Wild; Corning Glass Center; Tall Ships 1976; Philadelphia Zoo; Cincinnati Zoo; Milwaukee County Zoological Park; and the New England Aquarium. Recently, ERA has been the economic consultant for the 1980 Olympic Games in Lake Placid, New York.

ERA's expertise in state and local fairs and expositions recently included the development of a master plan for the Iowa State Fair and the Orange County California Fair, and the evaluation of redevelopment alternative for the State Fair of Texas. Additional State Fair studies completed by ERA include those for the states of Alabama, Tennessee, Florida, Iowa, Texas, Wisconsin, and California.

Theme Parks

ERA has played a major role in the development and/or operation of nearly all major theme parks in the world. Typically, ERA provides comprehensive economic and financial analysis, market research, concept development, reinvestment strategies, master planning, marketing programs, operational assistance and management services. ERA's clients have included: Disneyland; Disney World; Sea World; Marriott's Great America; Opryland; Hersheypark; Knott's Berry Farm; Universal Studios; Taft Broadcasting Company; GSC/Six Flags Corporation; Busch Gardens and Circus World, among others.

Sports and Performing Arts Facilities

ERA's economic planning efforts for sports and performing arts facilities have been integral to the planning of spectator accommodations - stadiums, amphitheaters, auditoriums, movie houses, arenas, and theaters - and participant sports facilities which include ice and roller rinks, golf courses, swim and water sports areas, tennis and racquetball clubs and multi-activity areas.

ERA's assignments have included the: Seattle Art Museum; Nassau County Coliseum; Philadelphia Sports Arena; San Diego International Sports Arena; Los Angeles Forum; Radio City Music Hall; Los Angeles Music Center; ABC Entertainment Center and the New York State Council of the Arts.

Resort Development

Resort development planning is intertwined with ERA's work in real estate and land-use economics. While initial land studies are under way, complementary research is needed into the recreation and lodging components of the master plan so that a proper balance of elements can be determined for the project that optimize financial feasibility. Innovative planning techniques have become essential in achieving the delicate balance between ecological and financial considerations. Finally, ERA can offer a number of on-



going services such as pricing strategies, marketing programs, and developer/operator selection and negotiations to assist the client in successfully implementing his project. ERA has been involved in the planning and feasibility analyses of major resort developments throughout the world, including Snowmass-at-Aspen, Walt Disney World, Northstar-Tahoe, Vail-Colorado, Kiawah Island, Sea Pines Plantation, Palmetto Dunes, El Morro Resort in Venezuela, Kaanapali-Hawaii, Las Hadas-Mexico, Costa Smeralda on the island of Sardinia, Incline Village, La Costa, Laguna Niguel and Grouse Mountain.

Public Recreation Areas

In the recreation sector, ERA has participated in the planning of local, regional and national facilities through the analysis of market needs, development of alternative concepts, determination of appropriate fees and charges, establishment of concessionaire policies, definition of support services requirements, analysis of visitor information and reservation needs, examination of internal transportation systems and provision of economic impact data.

Representative studies have included the analysis of market demand and facility needs for alternative development plans at the Grand Canyon, pricing considerations relevant to potential



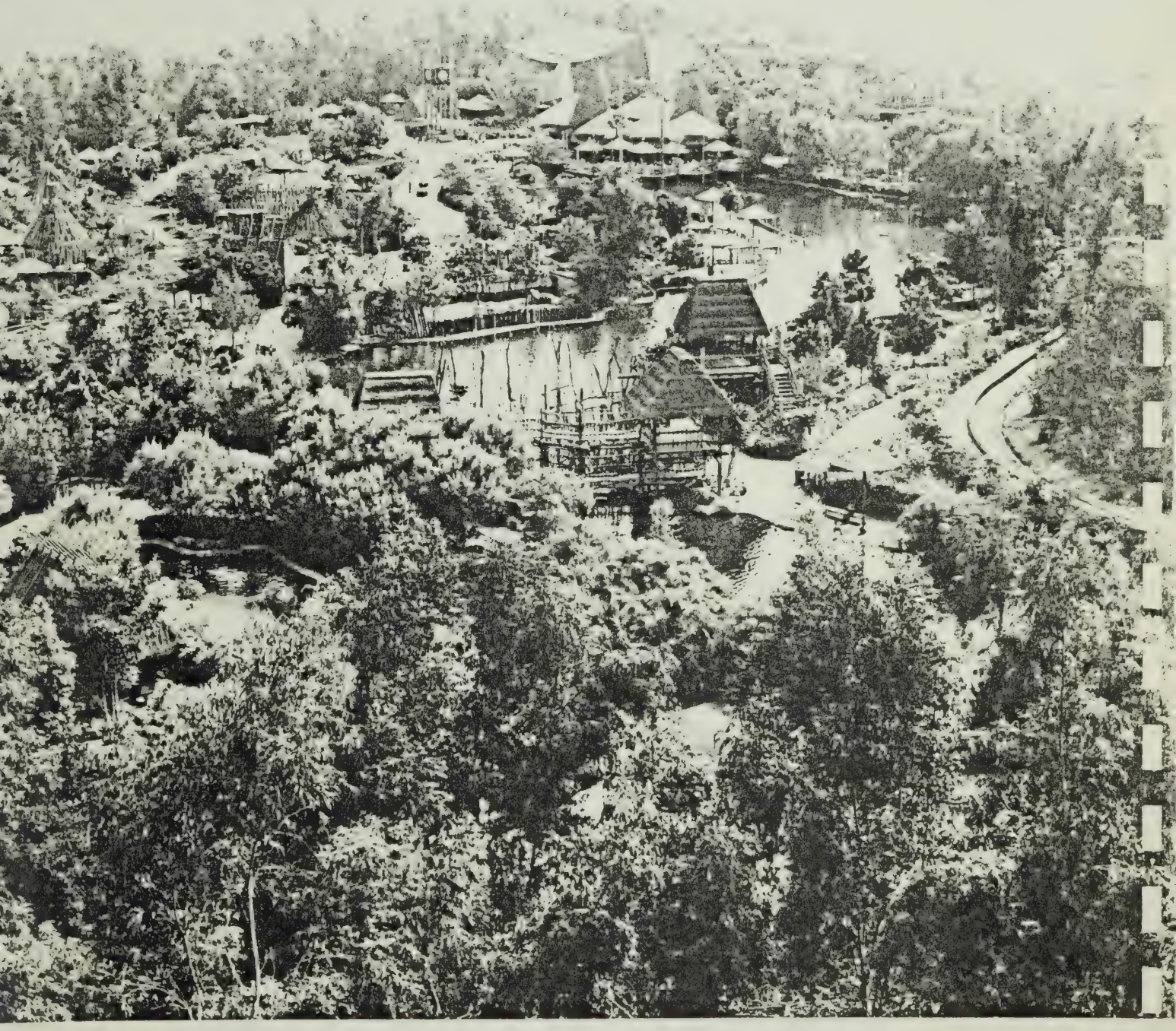
visitation to the Golden Gate National Recreation Area, and market factors, operating requirements and fee strategies for public marinas, golf courses, zoos, sports and cultural facilities, and local and state parks. Nationwide studies on the application of recreation and cultural fees and charges have been conducted for the Heritage Conservation and Recreation Service and the National Science Foundation. Other studies have included an analysis of reservation systems for state park users in California, concession operations and pricing at national parks, and facility and operations planning for zoos and recreation attractions.

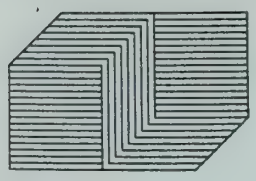


Clients have included federal agencies such as the National Park Service, Corps of Engineers, Department of Transportation, and Economic Development Administration; regional agencies such as the Tahoe Regional Planning Agency, Ozarks Regional Commission, New England Regional Commission, and the Tennessee Valley Authority; and state government clients including California, Iowa, Kentucky, New York, Florida and Massachusetts.

ERA professionals have also provided statistical assistance to many communities and park and recreation districts when applying for various Federal Grants and funding programs.







Hanscomb
Roy
Associates

Background

Hanscomb Roy Associates was established in 1957 when small offices were established in Toronto and Montreal. In the early days, the services provided to building owners, architects and contractors included the preparation of construction cost estimates and quantity take-offs. During the 1960's, as concern for closer economic controls over building projects spread, the range of the firm's operations expanded with the opening of additional offices in Ontario and Quebec. During the 1970's, further expansion took place into Western Canada, accompanied by a diversification of the range of services provided, into such areas as scheduling and time control, project management, economic analysis, research and development activities, energy and operations management.

HRA operates as a Partnership under the control and ownership of a group of Canadian engineers, quantity surveyors and architects. Today, HRA is a leading organisation of project control consultants, unique in offering an integrated and balanced range of management and control services. Further diversification and expansion is being planned and developed to meet the new challenges of the future.

General Approach

HRA is an outgoing and progressive firm with a strong innovative policy of continuing growth and diversification into complementary fields of service which offer new and challenging opportunities for professional development. Their stated purpose is to serve the contruction industry and building owners by increasing productivity and efficiency in the design and construction processes with the main objectives being to deliver building projects on budget, within the shortest possible period of time and at the best value for money. By helping building owners and design consultants to manage and control all aspects of cost, time, quality and performance in an unbiased and independent professional manner, HRA is recognized as one of the leaders in the coordinated management and control of building projects. The execution of HRA's purpose rests upon their ability to bring together in a team the professional and practical skills of project management, construction economics, quantity surveying and construction management. This approach is supported by a continuing research and development effort into procedural changes and new developments in the design, documentation, tendering and construction processes.

Benefits of Services

- Independent objective advice
- Tenders on budget
- Completion on schedule
- Minimisation of disputes
- Reduction of unexpected extras
- Value for money
- Reduced operating, maintenance and energy costs
- Maximum return on investment
- Innovative solutions to industry problems

People

Ian Aitchison, *Partner*	Ontario Land Economist, Toronto
John Arsenault, *Partner*	Electrical Quantity Surveyor, Edmonton & Montreal
Chris Baker, *Manager*	Quantity Surveyor, Calgary
Jacques Bissonnette, *Director, Project Management*	Architect, Montreal
Brian Bowen, *Partner*	Construction Economist, Montreal
Robert Charette, *Energy Division Coordinator*	Engineer, Montreal
Guy de Brouwer, *Manager*	Architect, Hull/Ottawa
John Dilworth, *Associate*	Construction Economist, Vancouver
Stewart Donnell, *Partner*	Quantity Surveyor, Hamilton
Geoffrey Hanscomb, *Partner*	Quantity Surveyor, London
Ed Hara, *Regional Manager*	Network Scheduler, Toronto
Marc Lauzon, *Associate*	Quantity Surveyor, Montreal
Peter Mason, *Regional Manager*	Mechanical Cost Engineer, Toronto
Marcel Milette, *Regional Manager*	Mechanical Quantity Surveyor, Montreal
Robert Myles, *Partner*	Construction Economist, Toronto
Guy Poulin, *Manager*	Architect, Quebec City
Laurence Purvis, *Manager*	Construction Economist, Montreal
Hans Rasmussen, *Partner*	Construction Manager, Calgary & Edmonton
Jean-Pierre Roy, *Partner*	Engineer, Montreal
Richard Schofield, *Manager*	Quantity Surveyor, Regina
Madat Shariff, *Manager*	Quantity Surveyor, Edmonton
John Spender, *Manager*	Quantity Surveyor, Winnipeg
John Walker, *Partner*	Quantity Surveyor, Vancouver
Cathy Westbrook, *Associate*	Accountant, Toronto
Al Wright, *Regional Manager*	Electrical Cost Engineer, Toronto

Personnel of Hanscomb Roy Associates hold memberships in the following associations:

American Arbitration Association
American Association of Cost Engineers
American Society of Heating, Refrigerating & Air Conditioning Engineers
American Society of Plumbing Engineers
Arbitrators' Institute of Canada Inc.
Association of Ontario Land Economists
Building Owners & Managers Association
Canadian Institute of Quantity Surveyors
Canadian Society for Civil Engineering
Certified General Accountants Association
Council of Education Facility Planners
Institute of Arbitrators
Institute of Building
Order of Architects of Quebec
Ordre des Ingénieurs du Québec
Ontario Institute of Quantity Surveyors
Quantity Surveyors' Society of British Columbia
Project Management Institute
Royal Architectural Institute of Canada
Royal Institution of Chartered Surveyors
Construction Specifications Canada
The Association of Professional Engineers of the Province of Ontario

Services

Project Management

- Pre-Contract Coordination
  - Design Coordination
  - Project Documentation
    - Contracts
    - Specifications
  - Consultant Coordination
- Construction Management
  - Construction Cost Management
  - Construction Time Management
  - Construction Quality Management
  - Construction Organisation
    - Construction Resource Utilisation
    - Site Organisation
  - Construction Coordination
    - Component Coordination
    - Labour Trade Coordination

Network Analysis

- Construction Scheduling
- Design and Documentation Scheduling
- Schedule Analysis

Feasibility Studies

- Appraisal
- Budgets
- Design Studies
- Economics
- Finance
- Marketing

Energy Management

- Energy, Operations and Maintenance Budgets
- Energy and Operations Audits
- Optimisation of Energy Systems
- Operations Management

Quantity Surveying

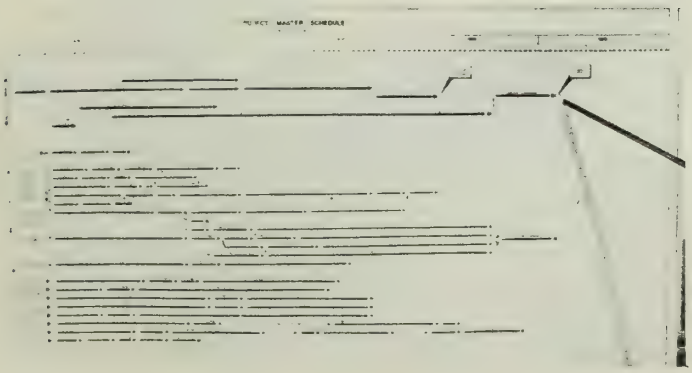
- Construction Economics
  - Cost Analysis
    - Cost Benefit Analysis
    - Elemental Cost Analysis
  - Cost Engineering
    - Value Engineering
    - Life-cycle Costing
  - Cost Control
    - Cost Planning
    - Cost Reports
  - Cost Estimates
    - Replacement Cost Estimates
    - Preliminary Cost Estimates
    - Bid Estimates
    - Operating Cost Estimates
- Quantity Surveys
    - Quantity Take-offs
    - Schedules of Materials
    - Schedules of Quantities

Arbitration

- Claim Settlement
- Expert Witness

Research

- Construction Price Indexes
- Construction Industry Information Systems
  - Cost Data Information Systems
  - Product Literature Information Systems
  - Technical Literature Information Systems
- Cost Control Automation
- Cost Research
- Design/Construction Decision Procedures

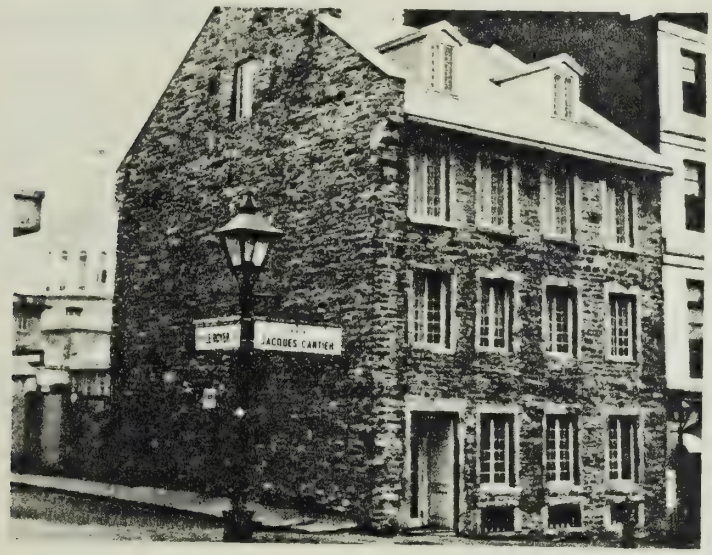


CFB ST - JEAN PROJECT
BUDGET STATUS REPORT

REPORT No. 16
EFFECTIVE DATE 28 FEB 77
ENERGY No 8/16

CONTRACT PACKAGES	EXPENDITURES TO DATE	CONTRACTED	ESTIMATE TO COMPLETE	FINAL ESTIMATED COST	APPROVED BUDGET	ESCALATION ALLOWANCE	ESCALATED BUDGET	VARIANCE + / -
204.Asbestos siding & roof deck - CMP	0	37740	3760	41500	35379	6871	42250	-750
205.Rough carpentry, roofing, waterproofing membrane - CMP	12288	12380	660	13000	15539	2938	18477	-5477
206.Masonry, finish hardware, metal doors & windows - CMP	16903	19364	1636	20800	9783	1408	11191	9609
207.Unused	-	-	-	-	-	-	-	-
208.Painting - CMP	0	0	15196	15196	12991	2205	15196	0
209.Unused	-	-	-	-	-	-	-	-
210.Plumbing & heating - CMP	361779	811798	12002	823800	702000	165366	867366	-23566
211.Ventilation - CMP	0	22400	1100	23500	17000	2946	19946	3554
212.Insulation & pipe covering - CMP	0	83700	2300	86000	39988	8359	48359	-2259
213.Unused	-	-	-	-	-	-	-	-
214.Electrical works - CMP	10370	163900	7100	171000	118370	19197	137567	33433
215.Tunnel	267500	252500	12500	265000	229000	29276	258276	6724
216.Unused	-	-	-	-	-	-	-	-
217.Unused	-	-	-	-	-	-	-	-
218.Unused	-	-	-	-	-	-	-	-

Offices







Calgary
415 — 14th Street N.W.
Calgary, Alberta T2N 2A1
(403) 283-3391

Edmonton
McLeod Building
10136 — 100th Street
Edmonton, Alberta T5J 0N8
(403) 424-2107

Hamilton
32 James Street S.
Hamilton, Ontario L8P 2Y1
(416) 525-5926

Montreal
433 Place Jacques Cartier
Montreal, Quebec H2Y 3B1
(514) 871-0020

Ottawa
504/130 Albert Street
Ottawa, Ontario K1P 5G4
(613) 232-2663

Quebec
44 Ave. Ste-Genevieve
Quebec, Quebec G1R 4B2
(418) 692-2601

Regina
2526 A 11th Avenue
Regina, Saskatchewan S4P 0K5
(306) 352-1639

Toronto
2301/Two Bloor Street W.
Toronto, Ontario M4W 3E2
(416) 961-8601

Vancouver
603/1200 West Pender Street
Vancouver, B.C. V6E 2S9
(604) 685-1241

Winnipeg
200B/338 Broadway Avenue
Winnipeg, Manitoba R3C 0T2
(204) 943-4516

Top: Montreal Office
Middle: Calgary Office
Bottom: Toronto Office

Representative Clients

Federal Government of

Canada

Provincial Government of

Alberta
British Columbia
Manitoba
New Brunswick
Ontario
Prince Edward Island
Quebec
Saskatchewan

Municipality of

Edmonton
Fort McMurray
Hamilton
Hull
Montreal
Prince George
Toronto
Vancouver
Winnipeg

Educational

Calgary Board of Education
McGill University
Simon Fraser University
University of Alberta
Université de Montréal
University of Ottawa
University of Saskatchewan
University of Toronto

Medical

Hôpital du Saint Sacrement, Québec
Hôpital Rimouski, Québec
Manitoba Health Services Commission
Prince George Regional Hospital, B.C.
Queen Street Mental Health Centre, Ontario
Toronto Hospital, Weston
University Hospital, Saskatoon
Wrinch Memorial Hospital, Hazelton, B.C.
Okanagan Similkameen Regional District, B.C.
Capital Region Hospital District, B.C.

Commercial/Industrial/Residential

Aronovitch & Leipsic Ltd.
Bank of Nova Scotia
Bell Canada
Cadillac Fairview Corporation Ltd.
Campeau Corporation
Canada Packers Ltd.
Canadian Pacific Ltd.
Central Mortgage & Housing Corp.
Citicorp Ltd.
Four Seasons Hotels Ltd.
Great West Life Assurance Company
Hydro Quebec
Insurance Corporation of B.C.
A. E. LePage Ltd.
Manitoba Housing & Renewal Corp.
Marathon Realty Co. Ltd.
Mercantile Bank of Canada
Metropolitan Life Insurance Co.
Ontario Hydro
Pacific Centre Ltd.
Underwriters' Adjustment Bureau Ltd.
Woods Gordon & Co.
Y & R Properties Ltd.

Architects/Planners/Engineers

Bittorf, Holland, Christianson Ltd.
Bond & Mogridge
W. H. Crandall & Associates
David, Boulva, Dimakopoulos
Trevor P. Garwood-Jones
Graham, Bacon, Welter
Larose, Laliberte, Petrucci
McCarter Nairne & Partners
MMP/Winnipeg
Moffat, Moffat & Kinoshita
John C. Parkin
Number Ten Architectural Group
Montreal Engineering Ltd.
Project Planning Associates Ltd.
Raymond Moriyama
Shore Tilbe Henschel Irwin
Smith Carter Partners
The Gardiner Thornton Partnership
Thompson, Berwick, Pratt & Partners
The Webb Zerafa Menkes Housden Partnership
Zeidler Partnership

Projects





Project: Olympic Village, Montreal
Client: COJO '76
Architect: Roger D'Astous & Luc Durand

Project: Gaslight Square, Vancouver
Client: Marathon Realty Co. Ltd.
Architect: Henriquez & Todd

Alberta Housing & Public Works — providing cost planning, cost control, estimating and research services on a wide range of projects.

Arctic and North West Territories experience — instrumental in developing systems designed to increase the accuracy of estimating and controlling costs in these areas, by extensive analysis of the problems associated with logistics and risk encountered in remote regions.

Canada-U.S. Manufacturing Facility Cost Study — comparison and analysis of building costs of manufacturing facilities at six locations in Canada and the U.S. The study establishes the magnitude of price differentials between each location and analyzes the reasons for these.

Carleton University, Ottawa — assignment of fulltime quantity surveyor to University staff with responsibilities for overall budget and cost control, cash flow reconciliation to capital entitlement and provision of individual project cost control services.

College of New Caledonia, Prince George, B.C. — pre-tender cost control services and cost evaluation studies. A program of $10.2 million construction value comprises a number of new buildings and facilities, with renovation of existing buildings, all phased and tendered separately over a 2-3 year period.

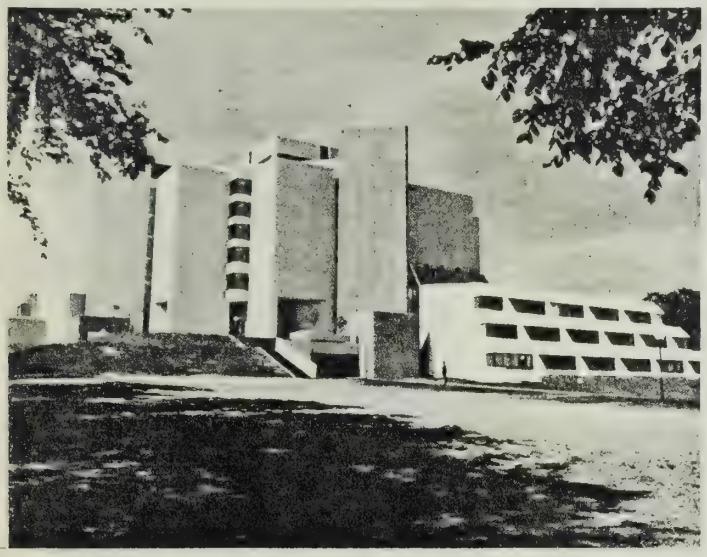
Cost-Benefit Studies, Building Management Systems — prepared economic evaluation of computerized building management systems proposed for Seven Oaks Hospital, Winnipeg, and the General and Pasqua Hospitals in Regina. The studies led to simplification of the systems, lower initial and long-term cost investment.

Cost Control & Estimating System for Steinberg's Ltd. — with emphasis on procedures for recycling historical data of completed projects to assist in the preparation of budgets and conceptual estimates.

Department of Public Works, Government of Manitoba — to act as life cycle cost consultants on a provincial office building project in Dauphin, Manitoba.

Economic Analyses for John Abbott CEGEP, Montreal — study comprised economic analysis between two options; one to remain in existing facilities at the client's present Macdonald campus, the other to construct a new campus at another location. The first option was selected and project management of the implementation phase is now under way.

Financial control services — provision oí cash disbursement control services to companies providing venture capital for real estate development projects.



Hamilton Place Cultural Complex — co-ordination of design phase, conceptual estimating, cost planning and cost control, pre-qualification of contractors, obtaining lump sum tenders based on schedules of approximate quantities, scheduling and financial management in this project over a period of four years.

Insurance Corporation of British Columbia — cost consulting for 17 claim centres, site monitoring and accounting for final account work for 8 centres in the lower mainland area and assistance in negotiation of stipulated sum contracts for 4 other centres. Projects in the lower mainland area were constructed on a cost plus fixed fee basis, in order to commence construction and design in parallel.

Language Training Centre, St-Jean, Quebec — provision of full cost planning and control services, with master scheduling on this $90 million project.

Life Cost Study — analysis of university building life costs, development of analysis methodologies, examination of HVAC system life costs for a selected university building, analysis of cyclical renewal requirement for the upgrading and maintenance of university buildings and analysis of the effect of building maturity on operation and maintenance costs.

Maison du Citoyen, Hull — complete project management on behalf of the municipality for this $15 million multi-use municipal complex. Services include project coordination, cost and schedule control.

Malton International Airport Expansion Program — member of Ministry of Transport Project Management Team, responsible for the planning, scheduling and monitoring of all design and construction activities on site.

Metropolitan Toronto Zoological Park — pre- and post-contract cost planning and cost control services on this $20 million project which comprised about 45 separate contract packages for buildings, services, site works, etc.

New General Hospital, Charlottetown, P.E.I. — pre-construction management involving program estimating, cost control and scheduling including preparation of project procedures manual and co-ordination of all design and construction activities.

Olympic Village, Montreal — responsible for ensuring that the requirements of all participants, agencies or committees were coordinated and met. Services performed during completion of design and construction phases included cost, time, quality and performance control, approval of construction techniques, letting of contracts and approval of all expenditures.

Ontario Hydro Head Office Building, Toronto — development of a budget control estimate which formed the basis for monitoring financial progress, negotiations with the developer and provided a framework within which progress payments and changes were evaluated.

Regina Hospitals Regeneration Program — appointed at an early stage to participate in preliminary studies on project implementation. Currently providing cost control services on this long-term project.

Solar Energy Data Base — development for the National Research Council of standardized reporting formats for the collection of data on solar heating installations throughout Canada. Assistance was also provided in the collection of the data.

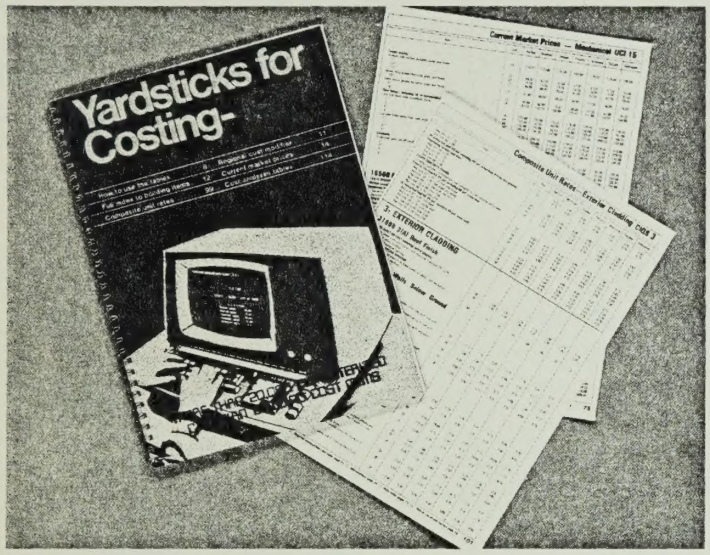
Study of Management Systems — analysis of current methods in use for the delivery and management of construction projects for the Department of Regional Economic Expansion.

Technical editors for 'Yardsticks for Costing' (construction unit price manual) — published annually with costs for seven cities in Canada. All cost data input is fully computerised.

University of Quebec at Montreal — pre-contract estimating and provision of full project control services for cost and time control during construction for this $55 million project.

Vaughan Theme Park, Maple, Ontario, for Kings Productions, Cincinnati — responsible for cost control, time scheduling and management support services during design and construction.

Subsidiaries/Affiliations





Canadian Air Structure Research & Engineering Ltd.
390 Bay Street, Suite 2601
Toronto, Ontario
and at: Montreal, Vancouver

Construction Data Systems Ltd.
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and at: Toronto, Vancouver

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Calgary, Alberta
and at: Montreal, Toronto

The CEREC Group Ltd.
200 Consumers Rd.
Toronto, Ontario
and at: Montreal, Vancouver

Internationally, Hanscomb Roy Associates, its subsidiaries and affiliates have jointly and individually participated in projects in many countries, some of which are:

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Ghana
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Indonesia
Iran
Iraq
Italy
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